ANNUAL REPORT FOR FISCAL YEAR 2002/2003

OMAF-FUNDED RESEARCH, EDUCATION AND LABORATORY SERVICES PROGRAMS

Integrated Research, Education and Laboratories Programs
Serving Ontario's Agriculture and Food Industries

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Report compiled by Dave Hume, Ken Hough and Office of Research support staff.

EXECUTIVE SUMMARY

Background

The University of Guelph is submitting this Annual Report to the Ontario Ministry of Agriculture and Food (OMAF). This is the first Annual Report on the OMAF/University of Guelph Agreement which was signed March 20, 2002. Annual Reports also have been submitted to OMAF for previous Agreements with the University of Guelph.

This report covers the activities, budgets, expenditures and performance measures for the programs covered by the Agreement. In this report the activities are reported for the University fiscal year from May 1, 2002 to April 30, 2003.

The program areas are Research, Education and Laboratory Services and a section is included for each area.

Summary of Activities and Results

During the 2002/2003 year, the new Agreement between the University of Guelph and OMAF was implemented. There are many new Performance Measure Agreements (PMA), which are reported on here.

During the year, the 4year reviews and the 4year future proposals were approved for the Resources Management and Environment and Sustainable Rural Communities Programs. The research proposals for next 4 years for the Plant Program also were approved.

There were 307 active research projects in 2002/2003. Highlights of research accomplishments are listed for each of the research programs in the areas of Animals, Plants, Resources Management and Environment, Food and Sustainable Rural Communities.

University of Guelph total research funding beyond the OMAF Agreement was $69.5 million, up 0.4% from the previous year. Support from NSERC increased by 29% or $4 million to $17 million. Business and industry support was constant at $16 million. In addition to the $69.5 million noted above there were announcements during the year of significant support for infrastructure, including $37 million from Agriculture and Agri-Food Canada to support the renovation and expansion of OVC's Veterinary Teaching Hospital, diagnostic laboratories and research infrastructure and $11 million from each of the Ontario Innovation Trust and the Canadian Foundation for Innovation for OVC's Institute for Animal-Human links in Health Science Research.

The number of peer-reviewed publications reported by OMAF-supported researchers was 350, a marginal 1.4% increase from the previous year. In one U.S private sector analysis (Graff, G., and J. Newcomb, Bio Economic Research Associates, Cambridge, Ma.), Guelph was the fifth-ranked University in the world in Research and Development in agricultural biotechnology during 2002/2003. Most targets in the research program were met. Seed royalty dollars declined to $320,000 from $510,000, primarily due to loss of market share to Roundup-Ready™ cultivars, but are expected to rebound with attractive new UofG varieties being offered for the first time. Non-seed royalties also declined from $500,000 to $425,000.

Diploma Education underwent a significant change as the University announced that most Diploma programs on the Guelph campus were to be moved to the satellite campuses, to make better use of University resources, to be completed by 2004. A new diploma program in Turfgrass Management will be initiated at Guelph in fall 2003 to take advantage of linkages with the Turfgrass Institute. A new program in Environmental Management at Ridgetown College and an expanded program in Food Science at Kemptville College were announced. Total Diploma Program enrolments increased 3% over the previous year to 1,060. Close to 100% employment was reported for the graduates. A new system was developed for determining cost per student in the various programs. Total revenues from Continuing Education programs at the regional campuses increased by 27% over 2001-2002.

The Laboratory Services Division (LS) continued to provide high-quality testing and diagnostic services to public and private clients in the agriculture, food and veterinary industries. The Animal Health Laboratory (AHL) performed about 590,000 procedures in support of disease surveillance. The Analytical Laboratory performed 817,000 procedures for plants, soil, water and food. Twenty new veterinary diagnostic tests were introduced, including West Nile virus, along with nineteen new analytical procedures for food safety. Over $2.5 million in new equipment was installed to upgrade capabilities. The ISO9001:2000 quality standard was achieved. Total revenue from outside the agreement increased to $9 million.

The Veterinary Clinical Education Program (VCEP) continued to provide support for the Veterinary Teaching Hospital Clinics, advanced clinical training, an externship and a 1-year post-graduate Veterinary Internship Program. There were 44 students enrolled in the graduate D.V. Sc. Program and some of them were supported by the VCEP Program. OVC was granted full accreditation by the American Veterinary Medical Association Council on Education for up to seven years.

The highly-acclaimed SPARK (Students Promoting Awareness of Research Knowledge) program produced more than 50 articles, which are listed. These articles appeared in a number of periodicals, publications, syndicated columns, and the University's **Research** magazine. A new agreement with OMAF's Town and Country Ontario television will have students contributing Info Breaks to that program as well.

There were few changes in management of the OMAF Agreement. Dr. Yoshi Mine replaced Dr. Valerie Davidson as Food Program Director. Dr. Wayne Caldwell served for part of the year as the interim leader of the Sustainable Rural Communities Program.

The University of Guelph expresses its appreciation to OMAF for the support and co-operation in delivering these services to Ontario consumers and agri-food clients.

1. Research Program

1.1 Accomplishments in 2002/2003

Management Accomplishments

- A new OMAF/University of Guelph Agreement, signed immediately before the 2002/2003 year started, was implemented.
- Following a strategic analysis and planning exercise major changes in the overall program were made to meet inflationary pressures in the budget. The co-operation of various units within the University is gratefully acknowledged.
- During the year, the review of the Plant Program was completed by the Agricultural Research Institute of Ontario (ARIO) and the proposed program for 2002-6 was approved.
- The Sustainable Rural Communities Program was reviewed by ARIO and the proposed program for 2003-7 was approved.
- The Resources Management and Environment Program was reviewed by both the OMAF Expert Review Committee and ARIO. The proposed program was approved for partial funding with adjustments to be made in the next year (2003/2004) for research pertaining to Nutrient Management.
- Dr. Yoshinori Mine replaced Dr. Valerie Davidson as the Research Program Director for the Food Program. The Program is fortunate to have someone of Dr. Mine's capability to take over this important role. Many thanks are expressed to Dr. Davidson for her excellent leadership in the Food Research Program.
- Numerous changes were undertaken in management of the Diploma programs, as a result of strategic review. To better utilize the resources available, Ridgetown, Kemptville and Alfred Colleges are prepared to accept increased diploma program enrolments, with most diploma offerings being discontinued at the Guelph campus.
- A comprehensive review of the use of buildings at the various locations was conducted and a number were declared surplus, in order to reduce the Charges for Accommodation. Agreements were signed for modern weather stations at Vineland, Ridgetown, Winchester, Alfred and Elora.
- Dr. Ken Leslie became the species coordinator for the Dairy Research Program. The contribution of Dr. John Walton in that position has been much appreciated.
- The Ontario Veterinary College was granted full accreditation by the American Veterinary Medical Association for a period not to exceed seven years.

Highlights of Research Accomplishments

Some of the highlights of the past year are listed below under the headings of each of the research programs. First, however, there is one overall highlight that illustrates the leverage which OMAF support has provided to the University of Guelph. In a report "Agricultural Biotechnology at the Crossroads, Part 1: The Changing Structure of the Industry", Bio Economic Research Associates of Cambridge, MA, a private advisory service, rated the University of Guelph 16th in a Table entitled "The top 35 R&D organizations in agricultural biotechnology". In the Table, the first five organizations are all companies. There are only four Universities rated higher than the University of Guelph. These are Cornell, the University of California, Iowa State University and Rutgers. The only other Canadian University on the list is the University of Saskatchewan, in 30th position.

Animal Program

- Dairy research in genome manipulation and reproductive technology was enhanced with the recruitment of two new specialists this year. Work continues on enhancing the efficiency of the cloning technique, with calves being born and tested. Genomics work is progressing to describe genes in the Canadian Holstein which have a major impact on protein yield and immune regulation.

- New developments in the beef and plant programs include the creation of a genetically altered alfalfa that contains an edible shipping fever vaccine for beef cattle. This project could make the task of vaccinating a large herd as uneventful as cows chewing their cud.

- Research at Guelph helped establish the market for omega-3 enriched eggs in Ontario and Canada. This 'designer egg' now represents about 5% of the Canadian egg market, with a value in excess of $10 million. The eggs contain up to 10 times the normal level of omega-3 fatty acids, which are important nutrients known to prevent certain cardiovascular disorders. Current research involves incorporation of other important fatty acids and lutein, which is important for eye health in humans.

- Canadian poultry farmers lose $10-20 million annually due to cracked and broken eggs. This problem is more common with older hens and is related to a type of osteoporosis. Researchers are now using an ultrasound machine that allows them to monitor bone density in older hens, and so measure response to such factors as diet calcium and various environmental conditions. The research suggests that nutrition 2-3 weeks prior to maturity can have a long-lasting effect on skeletal integrity.

- Genetic selection is playing a major role in a U of G/OMAF pork project to eliminate an unpleasant odour and taste in some pork caused by boar taint. The researchers are using tissue samples to develop genetic markers for identifying boar taint potential. These markers may allow Ontario producers to breed taint-free lines of pigs.

- Two special farrowing floors (FTF) were installed at the Swine Research Centre, Ridgetown College, University of Guelph to compare the efficacy of these floors on reducing piglet crushing by the sow with the standard rectangular stalls (SRS) fitted with rubber coated wire-mesh flooring and Oval stalls (OS) with similar flooring as the SRS. Data on 138 litters, 9 in FTF stalls, 103 in SRS and 26 in OS have been analyzed. The preliminary data showed that

crushing of baby pigs is reduced for piglets reared in the FTF stalls as compared to those reared in OS.

- A pneumonia-like condition termed Maedi Visna (MV) in Ontario sheep flocks will soon be under control due to efforts by Guelph and Kemptville researchers. A diagnosis and culling routine has been developed which will give sheep breeders the necessary tools to stop the virus from spreading and thus increase commercial opportunities for selling MV-free sheep.

- University of Guelph dairy researchers have developed a unique selection index that selects cows for enhanced immune response with no adverse effects on production. Utilization of this selection tool benefits farmers through a reduction in economic loss incurred by disease, processors benefit from enhanced milk quality and Canadian consumers benefit from ensured food safety.

- The long curse of the fatal foal disease, junctional epidermolysis bullosa (JEB), will soon be broken. A screening test for carriers of the mutated gene has been developed in the equine research program. When a foal inherits the mutated gene, it lacks a skin protein known as Laminin-5. Affected foals suffer painful skin sores and death usually occurs with a few weeks. This research discovery will help enhance the health and welfare of the Ontario equine population.

- Ontario's multi-million dollar aquaculture industry will soon be introduced to the UofG research program technology for producing yellow perch and tilapia. The technology package for warm-water management includes information for nutrition, reproduction, health and ultimate product quality.

Plant Program

- The insecticide success 480SC (Spinosad) was approved for use on approximately seventy different crops in Ontario. Success 480SC insecticide controls of a number of damaging pests in crops ranging from sweet corn and leafy vegetables to peppers, tomatoes, *Brassica* and snap beans. This reduced-risk product gives Ontario producers an important integrated pest management tool.

- A significant seed-treatment registration was obtained for use by Ontario growers of minor crops. Maxim 480FS (flutioxonil) was registered on a wide range of minor crops and in many cases several crop groups. This seed treatment controls seed-borne and soil-borne diseases caused by *Fusarium, Rhizoctonia* as well as *Aspergilius* and *Penicillium.* Seed treatments are viewed as IPM friendly and reduced-risk strategies for managing many important diseases.

- Assail 70WP insecticide is now available to control the Swede Midge in *Brassica* vegetables in Ontario. Assail is a systemic product and can be used as a preventative spray. Using both Assail and Matador, the other registered product, in rotation gives growers new tools to keep this devastating, quarantinable pest, now widespread in Ontario, under control.
- A new late-season strawberry variety, Serenity, with high yields of very large, bright, soft-skinned fruit was released to the industry after extensive trials. Since this variety fruits later than commonly grown varieties, it will extend the fruiting season for strawberry growers.

- Greenhouse tomato varieties bred in Israel and Italy responded better at lower average

greenhouse temperatures, compared to traditional Dutch-bred varieties. This has huge implications for cost saving in the greenhouse industry.

- A cold water treatment applied to the meristems of lilies resulted in significantly shorter plants. A height reduction of 50-60% was achieved without any chemical growth regulators. This low-cost treatment provides plants that are attractive and easy to transport.

- Good progress is being made in the development of antibodies in plants against toxin-producing organisms. Recombinant antibodies specific to E. *coli* O157:H7 and *Listeria monocytogenes* have been isolated and work is underway on several other organisms. Trials with tobacco plants producing antibodies are proceeding in commercial greenhouses. The technology should dramatically reduce the cost of antibodies and provide a high-value use for tobacco. Toxin Alert, the industrial partner, is working on the development of an antibody-based assay formatted onto plastic wrap so the presence of a toxin-producing organism in food would result in a colour change in the plastic wrap.

- Roundup-Ready™ soybean varieties were released from the University of Guelph soybean breeding programs for the first time.

- Transgenic soybean lines with resistance against the "Chatham" race of soybean cyst nematode have been identified.

- Through doubled haploidy, tissue culture, marker assisted selection and other more traditional breeding tools, an advanced winter wheat breeding line has been developed which has two genetic sources of resistance (both Sumei 3 and Frontana) and that has very good resistance to *Fusarium*, based on preliminary data received from the International Scab Initiative.

- Research over the past four years at the Ridgetown College/Department of Plant Agriculture, in collaboration with producers and industry, has confirmed a unique situation that corn producers have not had since corn came into production in Ontario many years ago. By combining the newly registered clothianidin with certain Bt events (MON 810 protection against all the major corn insect pests found in Ontario is possible.

- Winter barley bred within this program is becoming a popular, high-yielding option in the rotations of Ontario growers.

- Pulp and paper biosolids can be applied to agricultural land prior to corn production. In trials in Eastern Ontario, annual pulp and paper biosolids applications maintained soil organic levels in very porous sandy soil and slowly increased soil organic levels in finer-textured soils. No excessive soil nitrate-N was observed in the soil profile when 25% of the annual biosolid application was applied in the fall. Application techniques for the biosolid mulch layer were developed for very wet soil conditions in Northern Ontario.

- The Food Safety Network, has been established at the University of Guelph. The cornerstones of the network are the four ListServes that are distributed daily to more that 10,000 direct subscribers in 65 countries. The goal is to make The Food Safety Network the number one resource for farm-to-fork food safety, nationally and internationally.

Resources Management and Environment (RM&E)

- Greenhouse gas emissions were measured at the Arkell Research Station and at two commercial swine farms in Southern Ontario, during 2001 and 2002. Annual measured emissions were only about 50% of values used in the Canadian inventory of greenhouse gases, indicating that current estimates of GHG contributions from manure are overestimated. Emissions were also monitored during the composting of liquid swine manure and wheat straw at two farms, one with and one without forced aeration. The lack of aeration increased methane emissions to 24 times that of composting with aeration, but had no significant effect on nitrous oxide production. Total methane and nitrous oxide emissions from aerated composting were 28.2% and non-aerated composting emissions were 455% of liquid manure storage, respectively.

- Cases were developed to defend Canadian agricultural marketing against international trade disputes. Examples were an assessment of factors affecting the competitive position of the Canadian horticulture sector, cost of production data for the Canadian rebuttal for the WTO Dairy Dispute and an assessment of supply management in the poultry industry.

- A user-friendly computerized decision-supported tool (VFS_INT) has been developed that can be used to design vegetative filter strips based on site specific characteristics of the upland area contributing flow of sediments and phosphorous.

- A comprehensive, short-range (i.e. 0-50 km) dispersion modeling capability, AGMOD, has been developed to describe the fate of gaseous agricultural pollutants (e.g., CH_4, N_2O, H_2S, NH_3,), including odour, in the environment, which will aid in our understanding and management of agricultural 'greenhouse gases'.

- One approach to reducing the impact of manure in the environment is to reduce the amount of nutrients being fed to animals so that less is present in the manure. We assessed the benefits of supplying non-starch polysaccharides to swine based on the fecal excretion of nutrients and emission of major odour compounds in growing-finishing pigs fed diets based on corn and soybean meal. Exogenous cellulose and pectin at 4.5% decreased ammonia and sulfide emissions. Fibre supplementation at 4.5% improved nitrogen retention with no adverse effects on either calcium or phosphorus utilization. However, much higher levels of dietary fiber supplementation reduced overall nitrogen efficiency.

- The economics of dietary changes for four different sizes of swine finishing enterprises were simulated with the baseline being a standard corn-soybean meal ration and the assumption that farmers seeks to maximize farm net returns. The base situation was compared with dietary change situations that included the addition of synthetic lysine and the enzyme phytase. Both lysine and phytase additives were found to be cost-effective and profitable to farmers.

- The bioavailability of manure P can be influenced by management strategies used to improve feed P utilization by pigs. A study was conducted to assess the bioavailability of P in manure from pigs fed either a low phytate diet, a normal diet with phytase added, and a normal diet with and without a mineral P supplement. A normal diet fed to pigs genetically modified to produce phytase (i.e. Enviropig) was also included. Compared to the other treatments, the addition of a mineral P supplement to the diet increased the concentration of P in the feces, as well as the proportion of P in readily available forms. The manure from the Enviropig contained less P than manure from the animals fed either low phytate corn, given dietary phytase or a non-transgenic pig on the same diet. Typically this manure P was in P fractions

that would be considered less readily available and thus potentially less of a risk for movement from soils after application.

- Management practices affected greenhouse gas emissions from the soil, removal of the pollutant nitrous oxide from the air and the leaching of nitrate. Establishment of a beneficial management practice (BMP) system reduced environmental losses of applied N to 9.5 kg N/ha from 63 kg N/ha measured for the conventional production (CP) system. This reduction was not only the result of the smaller N input to the BMP system but also due to higher efficiency of applied N use, as shown by the reduction in the proportion of applied N lost: 42% for CP but only 19% for BMP. Consequently, nitrous oxide and leaching losses were significantly lower in the BMP when compared to the CP system. Similar yields in both systems indicated that these losses were minimized without affecting crop productivity.

- The fate of pathogens in manure was an area of priority. The hydrophobic character of the microbial cells is the most important single characteristic involved in their retention in soils. The presence of organic soluble matter and organic colloidal matter favours transport of microbes, most likely by competing for attachment sites in soil as well as by modifying the interaction patterns between the microbes, suspending liquid and soil surfaces. The smaller the dry matter content of manure the less the matrix flow, and therefore the greater the potential for macropore flow and surface runoff.

- Initial testing of a membrane filter system to treat liquid livestock manure looks promising. The vibratory shear enhanced processing (VSEP), from New Logic, California was able to separate liquid manure into two separate streams: a concentrated slurry and an equal quantity of clean water. The water portion is free of pathogens and nutrients.

- Survival of fecal bacteria in soil-manure mixtures was different for solid beef and liquid swine manure. With solid beef manure, the number of fecal bacteria increased on introduction to soil by up to three orders of magnitude, but their survival was of shorter duration than that of microbes from liquid swine manure in both soils tested and at all incubation temperatures. Liquid swine manure did not stimulate the same initial increase in numbers. Long-term survival of fecal bacteria was not dependent on the manure or soil type or on the incubation temperature, but was influenced by the organic matter content of the soil, and hence by its biological activity. Spills and poor liquid manure application procedures can introduce the bacteria into rivers and streams. Here they can persist for weeks, even months, and be available for resuspension and subsequent transport downstream.

Food Program

- The construction of a new home for the Canadian Research Institute for Food Safety (CRIFS) on the Guelph campus was a highlight. The new building includes a Level 3 Laboratory for research on toxic organisms. CRIFS is funded by $8 million in grants from the Federal/Provincial governments and industry.

- Within CRIFS, a newly installed Riboprinter was used to differentiate the genotypes within *Salmonella, E. coli* and *Listeria monocytogenes.* A method also has been developed to type *S. enteritidis* and *E. coli* 0157:H7 to allow better and more rapid identification of outbreak strains and monitoring in production and processing environments. These developments will

help to improve food safety and to minimize economic losses to industry due to recalls and litigation.

- In clinical trials, 19 of the 25 anthocyanins present in lowbush blueberries were isolated in the human blood serum after consumption. This was the first study showing the absorption of glycosylated and acylated forms of anthocyanins in humans and the first to display a correlation between anthocyanin absorption from blueberries and increased blood serum antioxidant capabilities.

- Modeling was used to optimize conditions for extraction of lycopene from tomatoes, using supercritical CO_2 extraction. The results will help in the development of automatic control systems for quality control in industrial production of lycopene and other nutraceuticals. In a related project, a fully-continuous supercritical fluid extraction process was developed. This could open the way for continuous extraction of high-value products.

- A study on Ontario beef identified some causes of winter toughness. These causes were greater connective tissue and toughness resulting from refrigeration being too rapid. A fluorescence probe for beef toughness was improved by a second channel for reflectance. The combined fluorescence and reflectance technique was superior to fluorescence alone

- The isolation of "anti-freeze" proteins from winter wheat and their incorporation into frozen products like ice cream reduces the formation of crystals when the frozen products are thawed and refrozen. The research has the potential to result in the extraction of high-value products from Ontario winter wheat and their utilization to produce superior quality ice cream.

- In multi-year trials, some cultivars of potato produced consistently better chip colour after storage at 4°C than other cultivars. In all cases, the cultivars producing better chip colour after chilling had higher tuber levels of ethanol and lactate, which are products of anaerobic respiration. The results imply that the cold-resistant cultivars divert carbohydrate away from sucrose and reducing sugar production through the anaerobic respiration pathway. This provides a metabolic pathway to target for molecular modification.

Sustainable Rural Communities (SRC)

- A book entitled "Sustainable Rural Communities in an Era of Globalization" was published jointly with The Ontario Rural Council (TORC). In it, much of the research in this relatively young program is pulled together as a guide for municipal leaders in rural communities.
- A survey of the impacts on rural communities of municipal restructuring was completed. Two reports from the survey have been in heavy demand.
- A detailed report is on the Web (www.uoguelph.ca/geography/RESEARCH/ffw/) of a study of the impact of foreign farm workers in Ontario communities.
- A detailed study of horticultural business statistics and the economic impact of the landscaping industry has been completed and reported.
- This program was reviewed and during 2003 re-approved for the next 4 years. More than 30 graduate students had worked on OMAF-supported projects in the last 4 years.

Research Projects Conducted in 2002/2003 and Approved for 2003/2004

	2002/2003		2003/2004		
Programs	**# Projects Active**	**# Projects Completed**	**# Proposals Received**	**# Proposals Approved**	**# Projects Active**
Animals	154	64	93	76	166
Plants	76	11	11	9	74
Resource Management and Environment	39	37	47	35	37
Food	26	8	12	10	28
Sustainable Rural Communities	12	9	14	9	12
Total	**[1]307**	**129**	**177**	**139**	**317**

[1] Adjustments were made to the 2002/2003 numbers reported in last year's Annual Report.

1.2 Budget

Funds for research were allocated to five commodity/discipline areas in the 2002/2003 budget. All research expenditures (Faculty FTE and program overhead costs) at all locations are included in Table 1.2-1.

Table 1.2-1: 2002/2003 Research Budget and Actual Expenditures ($ '000)

	Alfred		Kemptville		Ridgetown		Lab Services Div.		Guelph [1]		TOTAL		
	02/03 *Budget*	02/03 *Actual*	02/03 *Budget*	02/03 *Actual*	02/03 *Budget*	02/03 *Actual*	02/03 *Budget*	02/03 *Actual*	02/03 *Budget*	02/03 *Actual*	01/02 *Actual*	02/03 *Budget*	02/03 *Actual*
Plants	-	-	488	509	1,306	1,307	-	-	7,146	7,242	9,253	8,940	**9,058**
Animals	-	-	336	354	166	105	-	-	5,188	5,161	5,985	5,690	**5,620**
Food	-	-	-	-	-	-	-	-	1,327	1,256	1,334	1,327	**1,256**
Resources[2]	-	-	103	116	248	232	-	-	2,090	2,086	2,635	2,441	**2,434**
SRC[3]	-	-	-	-	21	21	-	-	301	266	257	322	**287**
Res. Stns.	182	209	1,217	1,182	640	711	-	-	6,627	7,272	9,956	8,666	**9,374**
Res. Prg. I & S[4]	102	114	81	80	300	211	-	18	311	311	351	794	**734**
Sub-Total	**284**	**323**	**2,225**	**2,241**	**2,681**	**2,587**	**-**	**18**	**22,990**	**23,594**	**29,771**	**28,180**	**28,763**
Institutional Ovhd[5]	42	45	762	655	553	496	-	-	6,032[6]	5,650	7,984	7,389	**6,836**
Total	**326**	**368**	**2,987**	**2,886**	**3,234**	**3,083**	**-**	**18**	**29,022**	**29,244**	**37,755**	**36,569**	**35,599**

[1] Guelph figures include combined Guelph and HRIO resources
[2] Resources Management and Environment
[3] Sustainable Rural Communities
[4] Research Infrastructure and Support
[5] Institutional Overhead/Support & Infrastructure
[6] Institutional Overhead/Support & Infrastructure at Guelph excludes $2.5 million accumulated transition costs, but includes proportion of $6.6 million service costs and other institutional support and infrastructure.

1.3 Performance Measures

Table 1.3-1 This Table lists the Performance Measures in the order shown in the Agreement and the results.

Objective	Measure/Activity	Result
1, A,B,C Priorities	OMAF-identified Research Priorities are met.	Research priorities were met. The Executive Committee was notified if researchers were unable to complete research commitments and alternative arrangements were made.
2, A,B,C Reporting	Delivery on time and within budget A and B. 95% of projects completed on time and within budget. C. Meet 90% of milestones for projects in progress.	A and B. A total of 114 Final Reports were submitted and 96% were on time. Arrangements have been made to get all but 4 (as of 28/08/03) of the overspent projects to a zero balance. C. 89% of milestones for projects still in progress were met. Several researchers commented that they established the milestones in their research proposal but some of the milestones were not met because the researchers received less funding than they had applied for.
3 Animal Care Standards	Meet or exceed Animals for Research Act and Canadian Council on Animal Care Standards	The only standard not met is that the Beef Research Barn # 1 at the Elora Research Station is not in compliance with CCAC standards. The barn is being rebuilt and the cattle have been moved to the Arkell Research Station.
4, A,B,C Funding from non-OMAF Sources	A. Annually increase funding from non-OMAF sources for research related to the OMAF Agreement.	Total Non-OMAF Funding for Research / Portion of Non-OMAF Funding for Research Related to Agreement ($million) 2002/2003: 69.5 / 42.7 2001/2002: 69.2 / 38.5 2000/2001: 61.5 / 35.3 1999/2000: 52.0 / 36.8 1998/1999: 38.0 / 23.8 Details of funding are found at www.uoguelph/research/summaries. There was a decrease in overall external funding, mainly related to the timing of overhead payments. Revenues from granting councils increased by $4.1 million.
	B. Annually increase research funding from business and industry sources.	B: Business and industry support stayed steady. 2002/2003: $16.4 (million). 2001/2002: 16.4 2000/2001: 15.4 1999/2000: 12.2 1998/1999: 12.0
	C. Report non-OMAF funding for infrastructure	C: Funding was announced during the year for $37.2 million for OVC from AAFC and $11 million from the Ontario Innovation Trust. Several smaller contributions added another $500,000 to infrastructure support at several locations
5 Intellectual Properties	Annually increase the number of licenses, patents and royalties.	The number of varieties for which royalties were paid (under Plant Breeders' Rights) decreased to 76 from 82 in 2001/2002 (see Table 4.1-1, 4.1-2 for listings). In addition, there are 35 patents and trade secrets in the U of G portfolio related to the OMAF Agreement. Last year, a total of 126 new invention disclosures across the University were reported.

Objective	Measure/Activity	Result
6 Royalties	Increased combined seed and technology royalties by an average of 5% per annum over the 5-year term of the Agreement.	Total royalties related to the OMAF contract decreased from $1.0 million in 2001/2002 to $745,000. Seed royalties decreased from $402,000 to $320,000. (Note: The value listed in the 2001/2002 Annual Report included $55,700 in royalties for a canola pollination system and $24,400 in non-seed fruit and vegetable royalties). A major factor is that the increase in planted GMO soybeans decreased the market share for soybeans that were not Roundup-Ready™. Both soybean breeding programs supported by the Agreement now have RR soybeans coming to market. Non-seed royalties to the University decreased from $490,000 in the previous year to $425,000, with over half of that for royalties on vaccines.
7, A,B Reporting	A. Submit Program Reports and Annual Project Reports on time. B. Annual summary reports to be submitted to OMAF by Feb. 15 on each project completed or in progress, in a form which can be readily communicated to the public	A: The target of reporting to OMAF by Feb. 15 on 95% of the OMAF projects in their final year was not met. By Feb. 15, only 84% of the expected final reports were in. B: Annual summary reports were made available in the form of Executive Summaries, which went on OMAF, University and CARC (Canadian Agricultural Research Council) websites. There was discussion about delivery in a format that would better support technology transfer. In many cases this would have required reporting the results of more than one year in order to increase the reliability of the results.
8 Scientific Productivity	Maintain or increase the annual number of: A: Peer-reviewed journal publications (Target: >300) B: Presentations at scientific conferences (Target: >400)	There were 350 peer-reviewed journal publications reported, compared to 345 in the previous year. In addition, there were 52 books or chapters in books published, compared to 68 in 2001/2002. Values reported are for publications dated in the calendar year, so the 2002/2003 report is for publications in 2002. The total reported was 449, compared to 487 in the previous year. The 449 is back to 2000/2001 levels. There was an increase in 2001/2002 because the Agricultural Institute of Canada meetings were held on campus and it was an opportunity for many graduate students to make presentations without major costs.
9 Communication of results to stakeholder or industry audience	Maintain 2001/2002 levels for the combined total number of: A. Presentations in the media B. On the internet C. At stakeholder or industry meetings	A: 188 articles in the popular press, compared to 190 a year ago. Many of the popular press articles are now written by SPARK writers after interviewing faculty, so the faculty are not the authors (see Media). B: There were 41 new presentations on the internet. Almost all the faculty involved in the Agreement have their own web pages. The total is >300. C: There were 367 presentations to stakeholder or industry meetings, tours, Diagnostic Days, etc. These activities have not been reported in this detail previously.
10 Expert Contribution	Maintain the number of committee commitments year to year	283 memberships on provincial, national and international committees were reported, compared to 232 reported for 2001/2002. Note that faculty were asked to report in more detail for 2002/2003.
11 OASIS Database	Complete a thorough review of research database needs	The review was completed but the updating of the system has not been done yet. Options for implementing the updates are under consideration.
12 Impact	Identify a method of measuring impact and submit to the Executive Committee	The method identified was Benefit:Cost ratio and this was presented to the Executive Committee. For some examples of research with significant impact, see the section on Highlights of Research Accomplishments in this Annual Report.

2. EDUCATION PROGRAM

2.1 Diploma Education
Kemptville College, Alfred College, Ridgetown College and Guelph Campus

2.1.1 Introduction

The year has been one of action, change, and growth, particularly with respect to OMAF-supported education.

Enrolments in the overall program increased slightly at each of the locations, indicating demand for the programs. At the same time, plans were put in motion to develop sophisticated, more targeted offerings. In addition, the constraints imposed by a traditional, two-year residential experience, particularly on people already in the work force, require a range of other, more flexible skills training.

The broad agriculture and horticulture Associate Diploma Programs at the Guelph campus took in their last entering class in the Fall of 2002, in anticipation of the regional campuses specializing in these programs. Beginning in the Fall of 2003, the new specialized Associate Diploma program in Turfgrass Management will be introduced at Guelph. A new program in Environmental Management will begin at the same time at Ridgetown and a new Associate Diploma Program in Food, Nutrition and Risk will begin at Kemptville. Environment and waste treatment will become one of Alfred's core strengths. The various Equine offerings at Kemptville will be incorporated into a major within the Agriculture Associate Diploma at that location. Some of the existing offerings will close, where demand is weak.

The process of developing Performance Standards for the Horticulture and Agriculture Diplomas has met some delays but is still making progress.

During the past year, a committee under the chairmanship of Dr. Ken Grant reviewed how the costs per student in the various Associate Diploma programs should be calculated and a standardized methodology was developed so an "apples to apples" comparison could be made of the various programs. For the first time this methodology was used and is reported in this annual report, along with the results of the previous methodology, so some continuity of comparisons are available.

The regional campuses have set out their highlights below. The University of Guelph will continue to use OMAF money wisely for education to benefit rural Ontario, and to leverage this resource for wider impact.

2.1.2 Alfred College

- Enrolment at Le Collège d'Alfred of full-time diploma students was up by six from the previous year. There were 115 students compared to 109 the year before. The seven year average is 106, and for the upcoming year, all indications, based on confirmed registrations received to date, are that the Collège will have its best year ever, with a full-time diploma enrolment of about 130 students. This is in spite of the dropping of the Horticulture Diploma, and only the second year students in the Food Diploma program, which is not being offered

again.

- As with the Vet Tech program, much work in the educational field at Alfred is being undertaken cooperatively with various partners, which include McGill University (Food Processing Technology Program), Collège Rosemont (Distance Horticultural Program), Prescott & Russell Adult Education Centre and the Prescott Apprenticeship and Training Centre (Certificates in such areas as Food Worker, Farm Worker, Landscape Worker, Sales Assistant and Administrative Assistant).

- In order to better address the needs of its community, and in keeping within the terms of the new Enhanced Partnership Agreement, Collège d'Alfred has initiated a number of short programs and certificates, on its own, or in conjunction with other partners. This commitment of Alfred is reflected in the OAC strategic plan and is seen to complement the regular diploma programs, which Alfred will continue to offer in French.

- In that regard, for the first time in the life of the Collège, Human Resources Development Canada has agreed to contribute a much needed $778,000 over three years, to enable Collège d'Alfred to develop some of its new initiatives. $625,000 of this funding has already been received with $275,000 expected in this fiscal year. The monies are from a special fund distributed through the Ontario Ministry of Training, Colleges and Universities, for Francophone colleges.

- In March 2003, Alfred submitted a major proposal to the federal government related to the development and implementation of a national training program in agriculture, in the French language.

- Alfred has had much success in obtaining international development contracts, some of which are collaborative with other institutions. Work related mainly with agricultural education and food technology, is currently occurring in the Comoros Islands, Morocco, Equatorial Guinea, and there are two separate projects in the Congo. On another international front, students from the International Development diploma program have spent time in both Romania and the Dominican Republic, as part of their studies, and during the course of the year, one student visited Congo on assignment to the CIDA-funded project. International activities contributed in excess of $200,000 to the Collège during the fiscal year.

- Collège d'Alfred's researchers are working in many diversified areas. One major educational component of their work is providing their expertise in conjunction with the Alfred-based Ontario Wastewater Centre, in giving approximately thirty courses a year at three locations in Ontario, lasting between one to five days, mainly to managers of (waste) water treatment systems. Some of the other more significant, non-OMAF sponsored projects being worked on, include ways of treating landfill leachate, research into artificial wetland usage, a project to develop a technique to reduce ammonia in artificial wetlands, an environmental impact study of biosolids, a feasibility study of biological methods for controlling pest insects in dairy farms, a project to develop an independent treatment system to take phosphorus from septic tank water, and research into finding an effective and economical way of producing ethanol from whey. One notable sponsorship with a local private sector enterprise, Lafleche Environmental, is worth $103,000.

- New diploma courses in Herbs and Aromatic Plant Production were introduced and well received this past year. Enrolment in that program, as well as in organic agriculture, is increasing.

- The Collège received its third refugee student under the Sponsorship program of the local WUSC committee. This group has been deservedly recognized by WUSC with a prize for being the most dynamic local committee in Canada. Two of the Collège's students and one staff member were selected to be part of a six week WUSC work program in the African country of Benin.

2.1.3 Guelph Campus

The impending move of the Agriculture and Horticulture programs from the Guelph campus to the regional campuses of Ridgetown and Kemptville continued to be a major topic of student interest, requiring significant advising resources to assist students in making program and career choices. Enrolment at Guelph in 2002/2003 was 359, exceeding that of the previous year at 356. Graduation numbers dropped to 123 for the 2002/2003 year, compared to 184 the previous year. This difference is the result of the unusually large first year class of 1999/2000 graduating in 2001/2002. Attrition rates in the 2001 at approximately 23% are comparable to previous years, while the 2002 cohort attrition is slightly lower than in the past at approximately 19%. This may indicate that students are attempting to graduate from Guelph before the programs are transferred to the regional campuses. It is further speculated that students from previous cohorts may be returning, and / or attempting to complete their programs on a part-time basis while maintaining employment. These factors will be monitored throughout the next year.

A special note of thanks and appreciation are extended to Ms. Kathy Biondi, former Director of Agri-Food Continuing Education Programs in the Dean's Office. Kathy has accepted challenges elsewhere, as others collectively fill the gap in leadership and coordination created by her resignation.

Explanations of changes in curriculum, emphasis and specialization that are being implemented for the 2002/2003 year and beyond:

Final Offering of Agriculture and Horticulture Programs: As a result of strategically realigning resources to capture efficiencies and to optimize capabilities at the regional colleges, the Guelph campus welcomed the final cohorts of the Agriculture and the Horticulture programs in Fall 2002. The Student Advising office made every effort to personally encourage this cohort to complete their program requirements as scheduled at Guelph. Special efforts continue to be made to contact those individuals from previous cohorts who have not yet graduated, so that they may make informed decisions about their education given the termination of the Agriculture and the Horticulture programs at the Guelph campus. The projected Fall 2003 registration in these programs is 170. Enrolment figures are preliminary at this time and will fluctuate until the September registration cutoff date. However, as of mid-August, 2003 there are approximately 153 returning students pre-registered, compared to 120 at a comparable time last year. As this is the final year, there are no significant changes to Agriculture and Horticulture curricula, emphases or specializations.

Program changes, new programs, and new initiatives:

New Associate Diploma in Turfgrass Management. Recognizing the expertise of faculty and professional staff, and the physical facilities and resources available on the Guelph campus, a new Associate Diploma in Turfgrass Management was developed, received Senate approval, and will

commence in September of 2003. Our target is to have 32 students in the first cohort of the program. Based on communications with the Office of Registrarial Services it appears that this number will be achieved. The program is administered within the Department of Plant Agriculture with direction and assistance from the OAC Dean's Office. The Director of the Guelph Turfgrass Institute, Mr. Rob Witherspoon, has taken on the additional responsibilities of Director and program counsellor for this new diploma program. A completely new curriculum has been developed, utilizing the expertise of faculty and staff associated with the Guelph Turfgrass Institute. Industry input into curriculum development was provided by reference to the Canadian Golf Superintendents Association's Occupational Standards for Golf Course Superintendents as well as feedback gathered from an industry focus group. The program will utilize a combination of OAC faculty and professional staff expertise as well as industry professionals for program delivery. The facilities of the Guelph Turfgrass Institute will also be used for practical experience components of the program.

Demand for the new program has been strong in the first year with more than two applicants for each available position. An applicant screening process was utilized to assess both academic performance and information from a Supplementary Information Form which provided an opportunity for applicants to articulate their experience, interests and professional goals in the field of turf management. Curriculum for year 1 of the program is ready for the first year intake, while details of year 2 of the curriculum continue to be developed.

Other New Initiatives under Development:

Progress towards the introduction of a new Bachelor of Bio-Resource Management (BBRM) continues, with a planned first cohort in Fall 2004, following the recent approval of this initiatitive by the UofG Senate. This new four-year degree program will be the first to receive MTCU funding for curriculum offered at regional campuses. The first two years are to be offered at Ridgetown and the final two years and convocation occurring at the Guelph campus. It is anticipated that the regional campuses will specialize in different majors, with the first major being offered at the Ridgetown campus. There is also a new specialization in Organic Agriculture under development within the B.Sc. (Agr) degree program.

2.1.4 Kemptville College

The Academic Programs at Kemptville College have undergone changes in the past year that have contributed to reduced costs and what we feel are improved programs for our clients.

- The Equine Studies Diploma has been phased out and with major curriculum changes is being offered as an Equine Option for the Agriculture Diploma. The change has been successful and resulted in increased student intake and therefore an overall reduction in costs. The riding courses and barn operations are being offered as certificates on a cost recoverable basis and are also looking successful.

- The Food and Nutrition Management Diploma has undergone a major change with the implementation of new courses addressing risk management and food processing which is scheduled to be introduced in September, 2003. The name of the program has been changed to the Food Nutrition and Risk Management Diploma.

- Power and Equipment Programs are being supervised and managed under the academic umbrella and have shown a huge reduction in costs since the changes have been made.

Business Development Training Group

1.1 Introduction

The BDTG at KC has had a good year with a positive balance of $110,000 at fiscal end and total revenues of $820,000. These figures apply to the following training and services programs including, apprenticeships, certificates and specialty courses:
Dairy, sheep, equine specialty courses, oil and gas heat, arboriculture, nutrition, food safety, nutrient management (new) and a variety of technical courses. Including equine certificates linked to the Diploma in Agriculture and the Power and Equipment revenues, the CE revenues have been $1,351,000 in 2002/2003.

The BDTG at KC also operates the bookstore in a profitable manner. BDTG has successfully diversified its sources of funding outside of pure training, especially in the area of Nutrition, Food Safety and Processing and in the area of Oil Heat training. Its project management capability and that of Ridgetown College BDTG have also been recognized in a Afast paced@ project carried out on behalf of MOE, in the area of Nutrient Management. Thus, approximately $350,000 of the $1,353,000 was generated from non-training activities.
The number of CE student training days for the period May 1/02 - April 30/03 is 18,270.

1.2 Key achievements beyond the delivery of 18,270 student training days

1.2.1 A strategic alliance with Ridgetown College

The two Business Development and Training groups met in the fall of 2002 and decided to join forces wherever possible. The results are tangible, with a joint $210,000 training contract from MOE (training of MOE compliance officers) secured within weeks after the joint venture was established.

1.2.2 The production of draft Operating Guidelines for the operation of the BDTG's

These operating guidelines, to be finalized in the fall of 2003, are meant to ensure the long term sustainability and profitability of the BTDG's through the following operational practices:

1. Sustainable cost recovery which includes College overheads, program renewal costs and contingencies
2. On-going program(s) review and renewal process
3. Documented program(s) management processes (marketing, pricing, communication policy, websites style and contents, steering committees)
4. HR selection (desirable qualities for various positions), training, accountability and reward system
5. Partnerships amongst BDTG's
6. On-going market positioning and prompt response to identified needs
7. Formation of an industry BDTG`s advisory committee
8. Process to produce large scale innovative, collaborative and successful funding proposals

1.2.3 Cooperative work with MOE on the new Nutrient Management Legislation

BDTG staff at Kemptville College and Ridgetown Colleges worked together closely to produce the training manuals for the Ministry of the Environment Nutrient Management Compliance Officers' Training Program. Effective collaboration between Kemptville College, Ridgetown College, MOE and OMAF resulted in a high quality training manual.

1.2.4 Joint Venture Agreement signed with the Oil Heat Industry

A Joint Venture Agreement has been signed with the Technical and Safety Standard Association (TSSA) and the Canadian Oil Heat Association (COHA) for the sale of Oil Burner Technician (OBT) training manuals in Canada and the US. This generated a $25,000 revenue for KC in retroactive royalties. KC is the lead Canadian College in the training of skilled oil heat technicians, most useful to rural communities highly dependant on oil as a fuel.

1.2.5 Multiple successes in the Centre for Nutrition, Wellness and Food Safety

New growing partnerships have been established with the following groups:

The Canadian Partnership for Consumer Food Safety Education (CPCFSE)

- KC worked with the CPCFSE to develop a national food safety campaign for College/University Students. Campaign to be piloted in fall 2003 B at four Universities in Canada
- KC rewrote the (CPCFSE) tabloid B Food Safety and Older Adults to reflect Food Safety and Families

The OMAF Science and Advisory Unit

- KC wrote chapters 11 and 111 of *Food Handling and Quality Systems* B A Training Program for Ontario's Food Processing Industry. Update course material from former Meat Industry Basics B Part 1 Independent Home Study program, administered through University of Guelph Independent Studies

The Small Scale Food Processors in Eastern Ontario

- With support from Agriculture & Agri Food Canada through the CARCI grant program, KC undertook a sector consultation with small scale food processors to determine support services needed by this growing industry sector.

2.1.5 Ridgetown College

- Ridgetown College graduated 151 students in 2002/2003 from the three diploma programs in Agriculture, Horticulture and Veterinary Technology and the Veterinary Medical Office Assistant certificate program. Graduates of all programs continue to enjoy excellent employment opportunities. A brief survey of the 2001/02 graduating class provided a 100% fully satisfied response to the overall question of the educational experience at Ridgetown College. Although only a partial survey, this compares very favourably to similar questions asked Community College graduates.

- A new diploma program will be introduced in the Fall of 2003. The Environmental Management diploma will herald a new direction for this college with the acknowledged environmental background the college has promoted for years. This new program is designed to attract a wider a ay of students to complement our Agricultural, Horticultural and Veterinary Technology strengths. Initial response to the program has been favourable with an anticipated enrolment of just less than 40 students. In addition, the community has been very supportive of this program, providing in excess of $20,000 for scholarships, awards and program start-up funds.

- Ridgetown College has signed an agreement with Redeemer College in Ancaster that will see students in their Bachelor of Science program in Horticulture attend Ridgetown for 2-3 semesters to take specific horticultural diploma courses to complete their degree at Redeemer. The first students from the agreement with start at Redeemer in the Fall of 2003 and will join the Ridgetown cohort in 2005.

- Ridgetown College introduced a new certificate program, entitled Landscape Management in Feb. of 2003. This is a unique, very hands-on program that runs from February to November to mirror the "business year" in the landscape industry. A small number of dedicated students are currently immersed within this program.

- The Ontario Pesticide Training and Certification Program (OPT&C) has seen a slight decrease in the number of applicants to this provincially-mandated program for certifying commercial pesticide applicators, due in part to pesticide restrictions in some municipalities resulting from environmental concerns. However, since many municipalities have prepared to carry out activities to control mosquitoes which potentially might carry West Nile Virus, there has been a very significant demand (>500 applications) for the Mosquito-Biting Flies exterminator license during the spring of 2003.

- The Livestock Medicines Education Program continues to offer educational courses to a wide range of livestock producers including the beekeeper and equine sectors. Although the legislation slated for April of 2003 is currently on hold, most livestock sectors have undertaken voluntary certification over the past three years and a number of commodity organizations are requiring certification as part of their Quality Assurance programs.

- The Business and Training Group at Ridgetown successfully offered a wide range of professional development programs to the industry in 2002/2003 and expanded these offerings to include Eastern Ontario in collaboration with Kemptville College. These programs identified as the 'Excellence In' series, provided the industry with an opportunity to gain over 75 Certified Crop Advisor (CCA) credits.

- College staff have been heavily involved in developing the outline and curriculum for a new degree program entitled the Bachelor of Bio-Resource Management (Horticulture Major) slated for introduction in the Fall of 2004.

2.2 Diploma Education Budget

Table 2.2-1 shows the diploma program budgets and actual expenditures, for 2002/2003. Overall actual expenditures were below budget by 2.6%, but increased 1.6% from 2001/2002. Only the Horticulture and Food and Nutrition Management expenditures were above budget.

Table 2:2-1: Diploma program budgets and actual expenditures, 2002/2003 ($ '000)
(Based on compilation method used in previous annual reports)

Program	Alfred			Kemptville			Ridgetown			Guelph			Totals		
	01/02	02/03		01/02	02/03		01/02	02/03		01/02	02/03		01/02	02/03	
	Actual	Budget	Actual	Actual	Budget	Actual	Actual	Budget	Actual	Actual	Budget	Actual	Actual	Budget	Actual
Agriculture	767	737	687	481	456	448	887	997	920	928	1,166	1,043	3,063	3,356	3,076
Horticulture	281	195	243	355	350	354	527	528	573	742	655	731	1,905	1,728	1,901
Food & Nutrition Management	202	155	171	324	355	385	–	–	–	–	–	–	526	510	556
Equine	–	–	–	695	744	662	–	–	–	–	–	–	695	744	662
Vet Tech	66	164	127	–	–	–	921	971	982	–	–	–	987	1,135	1,109
Overhead	625	635	677	445	506	433	295	297	300	535	583	568	1,900	2,021	1,978
Totals	**1,941**	**1,886**	**1,905**	**2,300**	**2,411**	**2,282**	**2,630**	**2,793**	**2,775**	**2,205**	**2,404**	**2,342**	**9,076**	**9,494**	**9,304**

The Colleges at Alfred, Kemptville and Ridgetown are funded for three primary functions; diploma education, research and continuing education and services. To put the Education budget in perspective, Table 2.2-2 shows the breakdown of expenditures in the individual programs. Balances were positive at Ridgetown and Kemptville. There were substantial increases in non-OMAF revenues at both of these Colleges. The reductions in research at Kemptville reflect the fact that some of the agronomic programs were no longer supported by the Agreement.

Table 2.2-2: 2002/2003 College Expenditures and Revenues ($ '000)

Program	Alfred		Kemptville		Ridgetown		Total	
	01/02[1]	02/03	01/02	02/03	01/02	02/03	01/02	02/03
Diploma Education [2]	1,941	1,905	2,300	2,282	2,630	2,775	6,871	6,962
Research [2]	294	368	3,109	2,886	3,055	3,083	6,458	6,337
Continuing Education [2]	642	467	1,745	1,947	1,859	2,138	4,246	4,552
Services: (Flow-through funds)								
- cafeteria	93	104	381	415	279	306	753	825
- utilities [3]	504	570	–	–	–	–	504	570
Total Expenditures	**3,474**	**3,414**	**7,535**	**7,530**	**7,823**	**8,302**	**18,832**	**19,246**
Revenues	1,349	1,258	3,351	4,216	3,914	4,319	8,614	9,793
Net Expenses	2,125	2,156	4,184	3,314	3,909	3,983	10,218	9,453
Base OMAF Budget	2,093	2,148	3,889	3,451	4,054	3,812	10,036	9,411
Transition & Other One-time Funding	–	–	27	547	(17)	298	10	845
Carry Forward from Previous Year	(120)	(152)	76	(192)	689	817	645	473
Total Budget	1,973	1,996	3,992	3,806	4,726	4,927	10,691	10,729
Surplus/(Deficit)	**(152)**	**(160)**	**(192)**	**492**	**817**	**944**[4]	**473**	**1,276**

[1] Amounts rebalanced between Diploma and Continuing Education for 2001/2002 at Alfred
[2] Program costs ***include*** allocated administrative (overhead) costs
[3] Utility costs at Ridgetown and Kemptville paid by ORC. At Alfred, utility costs are paid from University funds
[4] Includes carry-forwards (primary accumulated Continuing Education revenues) of $817 ($689 in 2001/2002)

Change from Previous Year (2002/2003 versus 2001/2002):								
% Change in Expenditures	**10.0%**	**-1.7%**	**-1.7%**	**-0.1%**	**-0.5%**	**6.1%**	**0.8%**	**2.2%**
% Change in Revenues	18.4%	-6.7%	-9.1%	25.8%	1.8%	10.3%	-0.6%	13.7%
% Change in Base OMAF Budget		**2.6%**		**-11.3%**		**-6.0%**		**-6.2%**

2.3 Performance Measures

Each of the individual Performance Measures (PM) will be addressed in the order they appear in the Agreement.

1A. The objective was to provide quality education and training programs to meet the needs of agriculture and food sectors and regional areas of Ontario. Quality was assessed in a number of ways. Results of surveys on student satisfaction supported high quality, as did surveys of employer satisfaction.

1B. This PM requires the implementation of newly developed program measures and standards for all programs by the end of the 5-year Agreement. The Provincial Diploma Committee, which includes representatives from all of the Colleges, has been working on these new measures and standards and is ahead of schedule.

1C. Enrolments, graduations, employment and satisfaction levels were to be maintained. Enrolments increased slightly (Table 2.3-1), to the highest levels in the last 4 years. The graduation and employment levels for graduates are shown in Table 2.3-2. Most programs were at similar levels to the previous year, with very few students unemployed. The only exception was the Veterinary Technician Program at Ridgetown, in which 10 graduated students reported they were not employed in 2003, compared to 7 students in 2002.

Attrition rates for the 2001 Diploma student cohort (Table 2.3-3a) averaged 27% over the 2 years. For the 2002 cohort, attrition averaged 16% (Table 2.3-3b). Historical attrition rates are shown in Table 2.3-4. There is a consistent trend for attrition to be higher at Kemptville than at the other Colleges. Attrition for the 3-year Summer Veterinary Technology Program is similar to other Diploma attrition rates (Table 2.3-5).

2A. Dr. Craig Pearson, Dean of OAC, reported during the year to the Executive Committee on the Strategic Plan for the Diploma Programs.

3A. Each College was to demonstrate positive growth in non-OMAF revenues over the 5-year term of the Agreement. There were large increases in revenues at Kemptville and Ridgetown in 2002/2003, compared to the previous year (Table 2.2-2), whereas revenues at Alfred decreased slightly.

4A. Colleges were to expand Continuing Education Programs on a cost-recovery basis, meeting regional needs. Revenues and Expenditures from Continuing Education Programs are shown in Table 2.4-1. There was substantial growth at both Kemptville and Ridgetown, but not at Alfred. Overall, revenues exceeded expenditures and enrolment numbers increased. Student-days and the range of fees per student-day for C.E. courses are shown in Table 2.4-2.

5A. Colleges were to submit recommended measures to ensure fiscal responsibility by September 30. A Committee chaired by Dr. Ken Grant from the Office of the President, University of Guelph, and including representation from each of the Regional Colleges and the Guelph Campus met numerous times to work out a standard method of reporting on costs per student. This report is to be submitted to OMAF prior to September 30, 2003.

5B. Costs per Diploma student were to be maintained or decreased. As indicated in 5A, above, a new methodology for determining costs per student was developed and tested. In order to provide comparisons with previous reports, this Annual Report includes calculations performed as in past Annual Reports (Table 2.3-6). Costs per student are shown for both 2001/2002 and 2002/2003. OMAF costs per student went down at each of the four Colleges in 2002/2003, compared to the previous year.

Results of a more detailed analysis, using the "Ken Grant Methodology", are shown in Table 2.3-7. In this analysis, costs were calculated for each individual program within Diploma Education and for Business Development and Training (Continuing Education), Ancillary Operations (e.g. residences, dining halls) and research. This allowed comparisons of educational costs separate from the other activities. The analysis revealed that programs with small enrolments were extremely expensive on a per-student basis. One of the conclusions is that new programs must either grow quickly in enrolments or have a different tuition structure than the traditional Diploma programs. Moving the general Diploma Programs in Agriculture and Horticulture from Guelph to the Regional Colleges should further lower costs per student at the Regional Colleges in the future, but new facilities will be needed to handle the increased student numbers.

The values for Diploma student assistance at each of the Colleges are shown in Table 2.3-8. Average award dollars per student were up over 2001/2002 at Ridgetown and Kemptville but down at Alfred and Guelph. At Guelph, part of the decline can be explained by the beginning of redistribution of Diploma Awards to other campuses as the general Diploma Programs at Guelph are phased out.

Enrolments

Table 2.3-1: Summary of Diploma Program Enrolments (Full-time students)

	Alfred	Kemptville	Ridgetown	Guelph	Total	Change
2002/2003	**115**	**229**	**360**	**359**	**1,063**	**3.3%**
2001/2002	109	223	341	356	1,029	-2.3%
2000/2001	111	238	323	381	1,053	1.6%
1999/2000	87	251	348	350	1,036	-8.0%
1998/1999	94	293	347	392	1,126	0.2%
1997/1998	112	272	316	424	1,124	1.8%
1996/1997	111	295	297	401	1,104	8.2%

Graduation Statistics

Table 2.3-2: 2002/2003 Graduates

Diploma Program	Alfred		Kemptville		Ridgetown		Guelph		Total	
	01/02	02/03	01/02	02/03	01/02	02/03	01/02	02/03	01/02	02/03
Agric.										
- Graduates	31	26	45	24	50	73	141	81	267	204
- % Employed	100% [1]	100%	100%	95%	100%	97%	95%	97%		
Horticulture										
- Graduates	3	3	8	9	19	13	43	42	73	67
- % Employed	100%	100%	100%	88%	100%	91%	90%	96%		
Food										
- Graduates	8	1	12	9	–	–	–	–	20	10
- % Employed	100%	100%	100%	90%	–	–	–	–		
Equine										
- Graduates	–	–	25	26	–	–	–	–	25	26
- % Employed	–	–	95%	92%	–	–	–	–		
Vet Tech										
- Graduates	18	0[2]	–	–	37	35	–	–	55	35
- % Employed	100%	–	–	–	80%	72%	–	–		
Total										
- Graduates	**60** [3]	**30**	**90**	**68**	**106**	**121**	**184**	**123**	**440**	**342**
- % Employed	**100%**	**100%**	**99%**	**92%**	**93%**	**89%**	**94%**	**97%**	**95%**	**93%**

[1] Includes one student who passed away having just graduated
[2] No graduates in Vet Tech. at Alfred because there was no 2001 cohort
[3] This high number is due to the first graduation class for Vet Tech. plus an increase from previous year in graduating students in Agriculture and Food
Note: Fall 2002 was the last enrolment in the Equine Program at Kemptville, and the Agriculture and Horticulture Programs at Guelph

Table 2.3-3: Attrition Rates for 2001 and 2002 Diploma Cohorts (2-year programs)

Table 2.3-3a: 2001 Cohort

	Alfred	Kemptville	Ridgetown	Guelph	Total
# Enrolled in Fall >01	42	117	149	161	469
# Enrolled in Fall '02 [1]	34	88	141	149	412
# Graduated	30	68	121	123	342
Attrition in Year 1	19%	25%	5%	7%	12%
Attrition in Year 2	12%	23%	14%	17%	17%
Total Attrition	**29%**	**42%**	**19%**	**24%**	**27%**

[1] Actual enrolments in Fall '02 (Numbers shown in 2001/2002 Annual Report for Fall '02 were pre-registration enrolment data).

Table 2.3-3b: 2002 Cohort

	Alfred[1]	Kemptville	Ridgetown	Guelph	Total
# Enrolled in Fall 2002	73	142	143	210	568
# Enrolled in Fall 2003[2]	58	114	133	170	475
Attrition Year 1	18%	20%	7%	19%	16%

[1] Two Alfred students finished their program in two semesters, and therefore they are not included in the calculations of Year 1 attrition.
[2] **Figures for Fall 2003 are based on pre-registration numbers**, which may not reflect actual enrolments accurately. (For example, the pre-registration number for Guelph as of mid-August is 153, whereas actual enrolment is estimated to be about 170). Since the Guelph program is being phased out, extraordinary efforts have been made to contact all students from past cohorts who have not completed their program.

Table 2.3-4: Summary of Attrition Statistics – 2 year Diploma Program

	Alfred	Kemptville	Ridgetown	Guelph	Total
Attrition in Year 1					
2002 cohort	18%	20%	7%	19%	16%
2001 cohort	19%	25%	5%	7%	12%
2000 cohort	17%	24%	13%	2%	12%
1999 cohort	0%	30%	19%	4%	15%
Attrition in Year 2					
2002 cohort	n/a	n/a	n/a	n/a	n/a
2001 cohort	12%	23%	14%	17%	17%
2000 cohort	3%	15%	12%	6%	9%
1999 cohort	22%	24%	15%	16%	18%
Total Attrition					
2002 cohort	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
2001 cohort	**29%**	**42%**	**19%**	**24%**	**27%**
2000 cohort	**20%**	**35%**	**24%**	**8%**	**20%**
1999 cohort	**22%**	**47%**	**31%**	**20%**	**31%**

Table 2.3-5: Attrition Rates for 3-year Vet. Tech. Program at Ridgetown

The summer Vet. Tech. program is a three-year course, so the numbers cannot be included with the two-year program numbers. This table summarizes the enrolments and attrition rates for this program.

Summer Vet Tech Cohorts Summer Vet Tech Cohorts

	1998	1999	2001	2002
# Enrolled in Fall 1998	36			
# Enrolled in Fall 1999	25	40		
# Enrolled in Fall 2000[1]	24	34		
# Enrolled in Fall 2001		31	40	
# Enrolled in Fall 2002			30	43[2]
# Enrolled in Fall 2003[1]			27	35
Graduated	24	31		
Attrition in Year 1	31%	15%	25%	19%
Attrition in Year 2	4%	9%	10%	
Attrition in Year 3	0%	0%		
Total Attrition	33%	23%		

[1] No intake of Vet. Tech. students in Fall 2000 and 2003 due to space limitations.

[2] This number is adjusted from the 2001/2002 Annual; Report to reflect actual enrolment rather than pre-registration numbers.

Financial Efficiency

X Table 2.3-6 details costs per student at the four Colleges using the same method used in previous years. Total cost figures at each location were calculated on the same basis. Cost differences between locations can be attributed primarily to differences in student numbers.

Table 2.3-6: Diploma Program Costs (includes Full Time and Part Time students)

	Alfred		Kemptville		Ridgetown		Guelph		Total		Average ($)	
	01/02	02/03	01/02	02/03	01/02	02/03	01/02	02/03	01/02	02/03	01/02	02/03
Total Cost/College ($ '000)	1,941	1,905	2,300	2,282	2,630	2,775	2,205	2,342	9,076	9,304	2,269	2,326
# Students (F-T & P-T)	114	122	223	229	341	360	366	359	1,044	1,070	261	268
Total cost/student ($)	**17,026**	**15,615**	**10,314**	**9,965**	**7,713**	**7,708**	**6,025**	**6,524**			**8,693**	**8,695**
Student fees paid ($ '000)[1]	473	548	1,135	1,302	1,269	1,361	1,308	1,411	4,185	4,622	1,046	1,156
OMAF cost/College ($ '000)	1,468	1,357	1,165	980	1,361	1,414	600 [2]	394 [2] [3]	4,891	4,682	1,223	1,171
OMAF cost/student ($)	**12,877**	**11,123**	**5,224**	**4,279**	**3,991**	**3,928**	**1,639**	**1,097**			**4,685**	**4,376**

[1] Student fees at Alfred cover tuition, residence, meal plan, laboratory fees, books and course notes.
[2] Includes allocation for overhead costs. However, diploma program (OMAF cost/college) is partially offset at Guelph by other University operations.
[3] OMAF Contribution at Guelph reduced in response to base budget reductions.

Table 2.3-7: 2002/2003 Cost per Student by Program ($'000) (New Methodology)

	Diploma Program											
	Agri	Equine	Food	Hort	Turf	Vet Tech	Int'l Dev	Total	Bus. Dev. & Training	Ancillary Operations	Research	Overall Total
Summary												
Number of Students September 2002	575	80	42	179	(2)	179	15	1,070				
Total expenditures [1]	2,711	590	523	1,808		1,176	324	7,132	4,329	2,899	6,361	20,720
Total expenditures / students	**4.7**	**7.4**	**12.5**	**10.1**		**6.6**	**21.6**	**6.7**				
Revenues	1,862	427	109	617		613	49	3,677	3,937	2,966	713	11,295
Total net expenditures [1]	848	163	414	1,191		564	275	3,455	390	(69)	5,648	9,424
Total net expenditures / student	**1.5**	**2.0**	**9.8**	**6.7**		**3.2**	**18.3**	**3.2**				
Locations where program is offered: Alfred	✓		✓	✓		✓	✓					
Kemptville	✓	✓	✓	✓								
Guelph	✓			✓								
Ridgetown	✓			✓		✓						

[1] Utility and maintenance costs, normally included in infrastructure costs only at College d'Alfred, have been removed to allow direct comparison to other Colleges
[2] Fall of 2003 is first year of enrolment for Turf Diploma program at Guelph

Table 2.3-8: 2002/2003 Value of Diploma Student Assistance

	Alfred		Kemptville		Ridgetown		Guelph		TOTAL	
	01/02	02/03	01/02	02/03	01/02	02/03	01/02	02/03	01/02	02/03
Student Awards ($)	38,150	35,470	35,650	41,075	47,225	53,099	63,700	57,085	184,725	186,729
Value of Awards ($) per student	374	284	160	184	138	147	174	159 [1]	177	175

[1] Guelph award per student is down slightly from last year, due largely to changes in times of presentation and the overall redistribution of Diploma Awards to other campuses.

2.4 Continuing Education (C.E.)

X Activities for Continuing Education are funded through contracts and certificate courses (including residential programs of up to one academic year), with the objective of attaining cost self-sufficiency.

Table 2.4-1: 2002/2003 Actual Expenditures for C.E. ($ '000)

	Alfred		Kemptville		Ridgetown		Total	
	01/02 Actual	02/03 Actual	01/02 Actual	02/03 Actual	01/02 Actual	02/03 Actual	01/02 Actual	02/03 Actual
Revenue Components:								
- continuing education	228	221	875	1,351	1,397	1,864	2,500	3,436
- conferencing/facility rentals	67	-	482	702	222	242	771	944
Total Revenue	**295**	**221**	**1,357**	**2,053**	**1,619**	**2,106**	**3,271**	**4,380**
Total Expenditures[1]	642	467	1,745	1,947	1,859	2,138	4,246	4,552
Net Expenditures	347	246	388	(106)	240	32	975	172
Base OMAF Budget	298	166	80	84	70	70	448	320
Surplus (Deficit)	**(49)**	**(80)**	**(308)**	**190**	**(170)**	**38**	**(527)**	**148**

[1] Includes overhead costs (as per Table 2.2-2)

Table 2.4-2: Student Days and Range of Fees/Student Day for C.E. Courses.

	Alfred		Kemptville		Ridgetown		Total	
	01/02	02/03	01/02	02/03	01/02	02/03	01/02	02/03
# of Student Days (6 hrs/day)	4,847	4,228	18,436	18,271	17,759	21,525	41,042	44,024
Diploma Student Equivalent[1]	40	35	154	152	148	179	342	367
Fees/day ($)	23 - 200	30 - 600	70 - 95	75 - 95	72 avg.	80 avg.	23 - 200	30 - 600

[1] Calculation: Divide number of student days by 120 (the number of days in a student year)

2.5 Veterinary Clinical Education Program

2.5.1 An Overview

The Veterinary Clinical Education Program (VCEP) Agreement provides annual base funding to the Ontario Veterinary College (OVC) to meet the continuing needs for:

- "veterinary graduates who have a high level of appropriate clinical experience in veterinary medicine to service Ontario animal owners";
- "an animal referral hospital which will service satisfactorily Ontario's veterinary practitioners and animal owners".

2.5.2 Objectives of the Program

A. Meet the accreditation requirements of the Canadian and American Veterinary Medical Associations as well as the College of Veterinarians of Ontario,

B. Provide the clinical education component for veterinary students in the Doctor of Veterinary Medicine undergraduate program,

C. Operate the Veterinary Teaching Hospital clinics including large animal, small animal, field service and diagnostic laboratories,

D. Offer a one-year post-graduate Veterinary Internship Program in the large animal and small animal clinics,

E. Offer an advanced clinical training program entitled Doctor of Veterinary Science (D.V.Sc.) in various medicine and health maintenance disciplines,

F. Offer an externship program of approved clinical experience with a private veterinary practitioner or a relevant public/private sector organization,

G. Offer referral and emergency veterinary services to Ontario veterinary practitioners and the animal-owning public. These include medicine and health maintenance services.

2.5.3 Resource Allocation

To meet the objectives of the VCEP agreement, VCEP funds were allocated to three programs; the Clinical Education Program (Objectives A to D and G), the D.V.Sc. Program (Objective E) and the Externship Program (Objective F). Table 2.5-1 summarizes the program's objectives, budget and expenditures. The total available VCEP budget in 2002/2003 was $4,597,663. For the year ending April 30, 2003 expenditures totalled $4,597,070 leaving a balance of $593. Of this budget; $3,930,452 went towards the Clinical Education Program (CEP), $417,870 to the D.V.Sc. program and $248,748 to the Externship Program.

The CEP portion of VCEP funded 12.4 faculty FTEs in the Departments of Clinical Studies, Population Medicine and Pathobiology. These faculty positions support teaching and service in

large animal medicine and surgery, anaesthesia, dairy, beef, sheep and swine health management and theriogenology. It also supported 2.75 professional staff, 21.5 staff, 6 internship students and 5.25 staff veterinarians in the Veterinary Teaching Hospital.

The D.V.Sc. portion funded 28 of the College's over 40 D.V.Sc. students.

The Externship portion of VCEP provided support for the student relocation allowance, organizational support staff, operating expenses and insurance, needed to deliver the course. The latter 8 week fourth year course is generally taken during the spring semester and is compulsory for all DVM students.

Table 2.5-1 VCEP Budget and Expenditures for Core Strategic Programs by Objective: 2002/2003

Programs	Objectives [1]	Expenditures Compared to Budget 2002/2003	
Clinical Education	A Meet accreditation requirements B Provide clinical education component for veterinary students in the DVM Program C Operate the veterinary teaching hospital D Offer a one-year internship program G Offer referral and emergency veterinary services to practitioners and animal owning public in Ontario	Personnel Operating Costs Renovations Total ***Budget*** Balance	3,378,682 463,002 88,768 3,930,452 ***3,928,835*** (1,617)
DVSc	E Offer an advanced clinical training program entitled Doctor of Veterinary Science	Support for DVSc's ***Budget*** Balance	417,870 ***417,870*** -
Externship	F Offer an externship program of approved clinical experience	Personnel Operating Costs Total ***Budget*** Balance	10,546 238,202 248,748 ***250,958*** 2,210
Grand Total		Total Expenditures ***Budget*** [2] Balance	4,597,070 ***4,597,663*** 593

[1] See pages 34-35 for complete wording
[2] Total includes a carry-forward of $71,497 from 2001/2002

2.5.4 CLINICAL EDUCATION PROGRAM

In compliance with Objectives A, B, C, D, and G of the VCEP Agreement, the OVC delivers a Clinical Education Program. To support this program, VCEP funding is allocated in the VTH and the three academic departments involved in clinical education: Pathobiology, Clinical Studies and Population Medicine.

Clinical Education is the largest component of the VCEP agreement. This program supports the clinical training of DVM students within the VTH. Clinical experience is gained in the various VTH services that include clinics in the large animal and small animal areas, and a field service program. Additionally, the Hospital offers referral and emergency services to veterinary practitioners and the animal-owning public for 24 hours a day, 365 days of the year. One hundred and six students were enrolled in the final year program in 2002/2003

Objective A: Meet the accreditation requirements of the Canadian and American Veterinary Medical Associations (CVMA, AVMA) as well as the College of Veterinarians of Ontario (CVO).

Performance Measures and Targets

Objective: To meet the accreditation requirements of the Canadian and American Veterinary Medical Associations as well as the College of Veterinarians of Ontario;

Expectation: The OVC will maintain its accredited status with the CVMA/AVMA, CVO and AAHA indefinitely.

Measurement Instrument:

- DVM Program assessment by the Council of Education of the American Veterinary Medical Association (AVMA).
- Annual Report sent to Council on Education of the AVMA.
- Accreditation of relevant clinics of the Veterinary Teaching Hospital (VTH) by the College of Veterinarians of Ontario.
- Accreditation status of relevant sections of the VTH, small animal clinical facilities, personnel and equipment by the American Animal Hospital Association (AAHA).

2002/2003 Outcome:

The OVC was granted full accreditation after the AVMA Council of Education site visit in February 2002 for a period not to exceed seven (7) years.

The AVMA accreditation process was developed to ensure quality professional veterinary education. The process uses periodic accreditation reviews to determine the degree to which the College meets a described set of standards as well as its own stated mission and objectives. The AVMA standards are recognized globally. This accreditation is crucial for the OVC to maintain its international reputation, to recruit candidates, to serve its mandate of teaching, research and service and to subsequently train veterinarians to meet the needs of the Province of Ontario.

The College of Veterinarians of Ontario (CVO) administers the Veterinarians Act. One requirement for licensure in Ontario is graduation from an AVMA/CVMA accredited college. In addition, no person can provide service from a veterinary facility unless the facility is CVO accredited. The VTH could not legally operate its various clinics without CVO accreditation. A

site visit and inspection was conducted by the CVO in February 2002. The VTH met all accreditation requirements for the small animal, food animal and mobile units.
The VTH Small Animal Clinic is also accredited by the American Animal Hospital Association. The last review took place in 1999 and the next is scheduled for 2003.

Objective B: Provide the clinical education component for veterinary students in the Doctor of Veterinary Medicine undergraduate Program.

Outcome assessment is now an integral part of the AVMA accreditation standards. In addition to the performance measures of the VCEP agreement the OVC has established additional performance measures to monitor student performance with a view to ongoing enhancement of its programs.

Performance Measures and Targets

Objective: To determine the degree of employer's satisfaction with new DVM graduate's performance in the workplace within the first year after graduation

Expectation: Greater than 80% of employers surveyed will express satisfaction with new graduate performance in the workplace during the first year following graduation from the OVC.

Measurement Instrument:
Employer Questionnaire
Employers of graduates of OVC 2002 were mailed questionnaires in August 2002. These veterinarians were asked to evaluate their new employee's overall performance / competence to do the job for which he/she was hired as; Superior, Very Good, Good, Poor (marginal but acceptable) or Very Poor (unacceptable or unsatisfactory performance).

2002/2003 Outcome:
The response rate to the survey was 71%. Of the employers who responded 95% were satisfied (i.e. rated new graduates as Superior, Very Good, or Good) with their employee's overall performance/competence, three to five months after graduation, to do the job for which they were hired.

Objective: To determine OVC graduates' perception/assessment of their preparedness for the job opportunities and responsibilities encountered in the workplace

Expectation: Greater than 80% of the graduates surveyed would express satisfaction with their performance in the workplace during the first year following graduation from OVC.

Measurement Instrument:
New Graduate Survey
Graduates of OVC 2002 were mailed questionnaires in August 2002. They were asked to evaluate their own overall performance / competence to do the job for which they were hired as; Superior, Very Good, Good, Poor (marginal but acceptable) or Very Poor (unacceptable or unsatisfactory performance).

2002/2003 Outcome:
The response rate to the survey was 68%. Of new graduates who responded, 96% were satisfied

(i.e. rated their performance as Superior, Very Good, or Good) with their overall performance / competence, three to five months after graduation, to do the job for which they were hired.

Objective C: Operate the Veterinary Teaching Hospital clinics including large animal, small animal, field service and diagnostic laboratories.

Performance Measures and Targets

Objective: To provide a reasonable volume of cases and teaching animals for student learning.

Expectation: A reasonably stable caseload of both client cases and teaching animals is maintained to allow instructors to teach with real clinical cases.

Measurement Instrument:
VTH statistics

2002/2003 Outcome:

Caseload in the Veterinary Teaching Hospital	2002/03	2001/02
Small Animal Client Admissions	12,554	11,992
Large Animal Client Admissions	2,086	2,203
Ruminant Field Service, Farm Visits	1880	1815

As shown above, the provision of on farm large animal services continues to be an area of emphasis.

Objective D: Offer a one-year post-graduate Veterinary Internship Program in the Large and Small Animal Clinics.

A one-year internship involves specialization in either the VTH's Small or Large Animal Clinics. Interns are usually new or recent graduates wishing to increase their level of discipline skills in an academic environment or to use this experience to help gain entry to more advanced graduate programs (i.e. D.V.Sc., Residency). Experienced veterinarians may chose an Internship to help them upgrade their level of knowledge or reorient their career path after some time spent in practice. The interns are paid a stipend of $21,000 per year. Currently VCEP funds support six interns. Revenue from the VTH funds an additional nine interns.

Performance Measures and Targets

Objective: To provide the graduate intern with a more competitive ability for acquiring a job, either in practice or in a residency program.

Expectation: At least thirty percent of the Interns that applied for residencies are successful in their application, and 70% of the Interns that applied to speciality practices are successful in their application.

Measurement Instrument:
Exit Survey
At the end of the program VTH Interns are surveyed as to their employment location and type of job for the upcoming year. Success rate in terms of obtaining a Residency will also be obtained.

2002/2003 Outcome:
As of June 2003, twelve (12) interns (86%) were successful in obtaining employment in the

private or public sector commensurate with their enhanced training. Twelve (12) applied to continue their studies in residency programs and seven (7) were successful (58%). Five interns obtained employment in private practice and two are exploring other training and practice options.

Objective G: Offer referral and emergency veterinary services to Ontario veterinary practitioners and the animal-owning public. These include medicine and health maintenance services.

Performance Measures and Targets

Objective: To meet the mandate as a full-service veterinary referral/emergency resource for the Province of Ontario. This service includes both emergency referral and elective referral services. The emergency service is available for 365 days / year, 24 hours / day for all common domestic species.

Expectation: All emergency referrals and 95% of all elective referrals will be accommodated by the Veterinary Teaching Hospital. Specialty services will be available for referral by Ontario veterinarians.

Measurement Instrument:
VTH statistics

2002/2003 Outcome:

2002 – 2003 Client Referral Caseload		
	Small Animal Client Cases	**Large Animal Client Cases**
Elective	10,655	1,122
Emergency	1,899	964
Total	**12,554**	**2,086**

2002 – 2003 Specialty Service Referral Caseload			
Small Animal Clinic		**Large Animal Clinic**	
Chemotherapy	1,063	Colic Management	375
Radiation Therapy	555	Laparoscopy	8
Nuclear Medicine Bone Scan	14	Foal Intensive Care	34
Cardiology	1191	Cardiology	30
TPL Osteotomy	52	Bovine Surgery	18
Diagnostic Ultrasound	1527	Diagnostic Ultrasound	388
Intensive Care	1556	Nuclear Medicine Bone Scan	46
Neurology	956	Neurology	85

2.5.5 Externship Program

In compliance with Objectives F of the VCEP Agreement, the OVC delivers an Externship Program.

Objective F: Offer an Externship Program of approved clinical experience with a private veterinary practitioner or a relevant public/private sector organization.

Performance Measures and Targets

Objective: To assess progress in achieving stated learning objectives during the Externship Course.

Expectation: That a statistically significant improvement in mean clinical performance scores will be achieved in most categories tested over the course of the Externship Course.

Measurement Instrument:
Interim and final evaluation questionnaires.
Questionnaires, which were completed by the externship student together with his/her Externship Course host, assessed 82 activities in large animal primary care practice and 100 clinical activities in a small animal primary care practice. Assessed activities included the ability to collect a relevant and accurate history, physical examination of an animal, formulation of a differential diagnostic problem list, development of a treatment plan and development of preventive strategies for common diseases and other problems encountered in domestic animals.

2002/2003 Outcome:
A statistically significant improvement in clinical performance scores was achieved in 177/182 (97%) of the categories or activities assessed.
For the summer of 2002 (OVC '03) the improvement in students' clinical performance over the eight-week placement involved in the Externship Course was similar to that reported over the previous five years. Data collected for the class of OVC '03 reflected considerable consistency in the clinical capabilities of OVC students at the end of their third year of the professional program. For the five activities that did not show statistically significant improvement (all of which did show some improvement over the eight-week externship period), the reason that statistical significance was not achieved was that the case numbers seen were too few.

Objective: To assess the extern's knowledge base and skills at the end of the Externship Placement.

Expectation: That 100% of the students will perform at a satisfactory ("C" grade) level or higher.

Measurement Instrument:
Host Practitioner Evaluations.
Host practitioners evaluated their extern's clinical capabilities in terms of diagnostic process skills, delivery of veterinary care, technical skills and professional conduct at the end of the Externship Placement. Each student in the class achieved a score of 83% or higher. This level of achievement is superior to that recorded for the classes of OVC '99 to OVC '02.

2002/2003 Outcome:
One hundred percent of the class of OVC '03 (Summer '02 Externship) performed at or better than a "C" grade level.

2.5.6 D.V.Sc Program

In compliance with Objective E of the VCEP Agreement, the OVC delivers the D.V.Sc. Program.

Objective E: Offer an advanced clinical training program entitled Doctor of Veterinary Science in various medicine and health maintenance disciplines.

Performance Measures and Targets

Expectation: At least 90% of the students will complete the program successfully in approximately three years.

Measurement Instrument: University of Guelph graduate student registration data

2002/2003 Outcome:
During 2002/2003 five VCEP funded D.V.Sc. students completed the program. The mean time to completion for these students was 11 semesters or 3.6 years. Details of discipline, enrolment, and graduations are outlined in Table 2.5.7-1.

The normal duration of the DVSc program, and funding support, is nine semesters (three years). The College maintains the equivalent of one stipend in "reserve" to deal with one-semester extensions when needed to complete the thesis. Approximately one-third of the students receive this additional semester of support if a formal request is made by the faculty Advisor and Advisory Committee. Overall, in the 7-year report completed three years ago for the Ontario Council of Graduate Studies, the mean DVSc completion time was 9.3 semesters.

Table 2.5.6-1 D.V.Sc. Enrolment and Graduations During 2002/2003

Department and Discipline	Enrolment	Graduations
PATHOBIOLOGY		
Anatomic Pathology	4	1
Clinical Pathology	3	0
Other	5	0
Total Pathobiology	**12**	**1**
CLINICAL STUDIES		
Companion Animal	8	0
Farm Animal	7	2
Other	10	1
Total Clinical Studies	**25**	**3**
POPULATION MEDICINE		
Theriogenology	3	1
Epidemiology	1	0
Health Management	2	0
Total Population Medicine	**6**	**1**
BIOMEDICAL SCIENCES		
Total Biomedical Sciences	**1**	**0**
OVC Total	**44**	**5**

Expectation: Enrolment in the D.V.Sc. Program should be at least 20 students

Measurement Instrument: University of Guelph graduate student registration data

2002/2003 Outcome:
The College's D.V.Sc. program had 28 VCEP fund positions, with the remainder funded from other sources. Table 2.5.7-2 includes all new D.V.Sc. students and graduates for period May 1, 2002 to April 30, 2003. During 2002-03 13 new students enrolled in the program.

TABLE 2.5.6-2 THE VETERINARY CLINICAL EDUCATION PROGRAM: STUDENT ENROLMENT SUMMARY

Department	Discipline	Status (Place of Employment)
Clinical Studies	Small Animal Surgery	1 New Student
	Small Animal Medicine	1 New Student
	Large Animal Surgery	1 New Student 1 Graduate (VTH, OVC)
	Large Animal Medicine	2 New Students 1 Graduate (University in Slovania – Ljubljani)
	Cardiology	1 New Student
	Anesthesiology	1 Graduate (University in Brazil - Federal do Parna)
Pathobiology	Avian/Exotic	1 New Student
	Clinical Pathology	1 New Student
	Anatomic Pathobiology	1 New Student 1 Graduate (Histovet Ltd.)
Population Medicine	Theriogenology	2 New Students 1 Graduate (OVC Population Medicine)
	Ruminant Health Management	New Student
	Swine Health Management	New Student

3. LABORATORY SERVICES DIVISION

3.1 Highlights

- The Laboratory Services Division (LS) provides testing and diagnostic services in support of OMAF's regulatory and disease surveillance programs. In addition, LS is expected to generate sufficient funds to replace and upgrade its infrastructure, including facilities and technical capabilities. In order to generate reinvestment funds, LS provides testing services on a fee-for-service basis to government, universities and the veterinary and agri-food industry.

- The Animal Health Laboratory performed approximately 590,000 tests in support of disease surveillance while the laboratories at 95 Stone Road performed approximately 817,000 tests in support of the regulatory programs. The trend to more complex central lab testing combined with simple on-site screening continued for the food testing programs. The increased expense of the complex testing offset savings from reduced central lab screening.

- During 2002/2003, activities focused on improving effectiveness and expanding capabilities. The improvements to the Animal Health Laboratory sample handling and data entry were implemented. A review of the Raw Milk Quality and Composition Testing Program was conducted. The recommendations arising from that review will be implemented in 2003/2004. A program was initiated to improve capabilities for the testing of veterinary drug residues.

- Revenue from external clients in 2002/2003 increased to $9.0 million from $6.4 million in 2001/02. The increase was due in part to a small number of large short-term projects as in the previous year.

- Excellent financial results allowed Laboratory Services to reinvest $2.5 million in equipment and infrastructure. A large portion of the funds was allocated to analytical equipment although facilities upgrades and repairs are also included in that amount. The equipment improvements enabled LS to introduce the new testing capabilities that are required to support OMAF's programs.

- OMAF's testing requirements have continued to evolve. The scope of chemical testing has increased and Laboratory Services responded by expanding capabilities. A number of short-term investigations were supported. Rapid reporting ensures actionable results.

- Laboratory Services has a strong quality program. This year LS moved from the ISO 9002:1994 standard to the ISO9001:2000 standard. This required a major change in the quality management program that is the backbone of our quality system.

3.2 Budget

The Laboratory Services Division (LS) provides testing and diagnostic services to public and private clients in the agriculture, food and veterinary industries. This report deals with those services that LS provides under the terms of the OMAF/UofG Agreement. The report describes the testing services provided to the Food Industry Division (FID) and the Agriculture and Rural Division (ARD) of OMAF and the diagnostic services carried out on behalf of the Livestock Technology Branch of ARD.

Under the terms of OMAF/UofG Agreement, the Laboratory Services Division receives funding for the specific testing services described previously. In addition, LS is required to earn sufficient additional income to replace and upgrade its infrastructure. To that end, LS provides testing, on a fee-for-service basis, to various clients in the public and private sector. It is estimated that LS must reinvest at least $1.5 million per year in infrastructure replacement and upgrades in order to maintain the current level of capabilities to meet OMAF's testing requirements. This does not cover the needs for expansion of testing capabilities to deal with emerging problems and regulatory requirements. As needs evolve, additional investment is required to acquire the new technology to meet increasingly complex test requirements.

Financial Results (for the year ended April 30, 2003) ($ in '000)

	01/02	02/03	02/03
Expenditures	**Actual**	**Budget**	**Actual**
Animal Health Labs	5,500	5,200	5,300
Analytical Services	2,200	2,300	2,800
Regulatory Services	3,100	3,500	3,800
I & S[1]	3,100	3,000	2,800
Reinvestment	2,300	1,900	2,500
Total Expenses	**16,200**	**15,900**	**17,200**
Revenue (external clients only)	6,400	7,000	9,000
OMAF Funding	9,000	9,000	9,000
Carry forward surplus & other funding	800	0	300
Total Funding	**16,200**	**16,000**	**18,300**
Surplus/(Deficit)	0	100	1,100

[1] Infrastructure and Support

Laboratory Services had another successful year financially. Financial performance included the following:

- Revenues from external clients of $9.0 million exceeded Budget by $2.0 million. Including revenues from other University of Guelph departments, total revenues were $10.8 million for the year. Much of the increase in revenues is the result of several larger projects, such as Plum Pox testing. Aggressive marketing will need to continue in the future, as much of the revenue growth is short-term projects with a definite end date. The ongoing marketing challenge will be to replace the revenue from these short-term projects on a yearly basis.

- Reinvestment of $2.5 million exceeded Budget by $0.6 million.

3.3 Performance Measures

Under the terms of Schedule K of the OMAF-University of Guelph Partnership Agreement, the Laboratory Services Division (LS) is expected to provide OMAF with laboratory services that address OMAF's program needs. The OMAF program manager defines the quantity and type of testing to be done for the regulatory programs. Each year the respective program manager provides LS with a sampling plan. The sampling plan varies from year to year. Since the disease surveillance program is based on a passive system the actual number of tests is not defined but a target volume has been established. A primary measure of performance under the agreement is the ability of LS to deliver the required volume and type of tests specified in the timeframes required.

The AHL performed approximately 590,000 procedures under the passive disease surveillance program. Veterinarians who use the OMAF supported service were surveyed. 93% of the respondents rated the service as satisfactory or better, while 7% of the respondents did not rate the service. In other words all respondents that rated the services found them satisfactory or better.

The LS also carried out the scheduled testing programs described under the performance management agreements for plants, soil and water and for food. A total of approximately 817,000 procedures were completed. The program managers who use the testing service were surveyed and 100% rated the service as satisfactory or better.

There is an expectation that LS will generate sufficient income to finance infrastructure upgrades that support technological improvements in the testing services. A target for reinvestment was set at $1.9 million and this target was exceeded as described under section 3.4.

The scope of testing was expanded significantly to meet our varied clients' emerging needs. Twenty new veterinary diagnostic tests were introduced. Support for the investigation of viral pathogens using rapid PCR technology has been a focus of development. West Nile testing was introduced. Nineteen analytical procedures were introduced for food safety testing. The scope of testing for veterinary drug residues in various matrices has been enhanced to meet concerns about the human health risks these chemicals pose. The plant pest diagnostic testing increased to include 25 new viral tests, 4 new tests for bacteria and 2 new tests for fungi. This is an unusually large number of new procedures to introduce in a single year. All new methods require a rigorous validation procedure to ensure they meet quality standards. Considerable resources were allocated to developing new methods in 2002/2003.

There is an expectation that LS will maintain quality programs. Laboratory Services successfully completed the ISO9001:2000 registration audit and the Animal Health Laboratory maintained accreditation by the American Association of Veterinary Laboratory Diagnosticians.

3.4 Reinvestment ($'000's)

The table below details key reinvestments made in 2002/2003. A detailed inventory of equipment including all new acquisitions is submitted to OMAF on a yearly basis. Major acquisitions are noted in the table.

Reinvestment Expenditure	Amount ('000's)
4 HPLC	333,877.70
HPLC MS/MS	329,004.55
5 GC/MS	260,656.51
Computer hardware & software	153,246.00
Magna Pure LC System	125,753.40
FOSS FT120 Analyzer	115,628.83
Furnace / Hydride AAS system	106,496.59
Distillation still - 95 Stone Rd	85,522.39
Isoplator	76,297.69
Steam generator - 95 Stone Rd	64,360.90
Tissue processor	60,971.65
Other (expenditures less than $60,000 ea.)	804,953.79
Total	$ 2,516,770.00

3.5 Improvement Projects

As part of a long-term plan for improving effectiveness, LS carried out a number of projects aimed at improving processes. The goals for these projects are to improve the use of resources while maintaining a high quality service at a reasonable cost. Business improvement projects are part of Laboratory Services' long term strategy for continuous improvement and cost containment.

The sample receiving and data entry processes in the AHL were reviewed in 2001/2002. The recommendations for process improvement were implemented. This involved renovations and changes to the workflow.

The laboratory processes supporting the raw milk testing program were reviewed with the assistance of a consultant. The current system is largely manual and an opportunity exists to automate the sample tracking and data management. This will provide industry and OMAF with a wider range of information while simplifying the record keeping and sample tracking. OMAF, the Dairy Farmers of Ontario and the Ontario Dairy Council have agreed in principle to developing an electronic tracking system.

3.6 Accommodation and Planned Upgrades

Animal anatomical waste disposal remains a pressing problem for the AHL. The AHL has traditionally used deadstock operators to remove the bulk of the anatomical waste generated as a result of diagnostic activities. There is uncertainty regarding the future of the deadstock industry. The incinerator at the Kemptville site is currently out of service, with maintenance and upgrades scheduled for completion by the end of 2003. During 2002/2003, the University of Guelph conducted an evaluation of waste disposal options. The long-term goal is to replace the single

incinerator at Guelph and to find a solution for the Kemptville site as well.

During 2002/2003, through the efforts of the Ontario Veterinary College, an opportunity developed for a new AHL facility. Planning for a potential new facility began in 2003. This facility would be part of the Ontario Veterinary College re-development. The new facility will allow for more effective use of space rather than an increase in space. A proposal for a level 3 (bio-containment) post mortem facility was also developed. Such a facility would be essential, if the AHL were required to support the investigation of an outbreak involving a level 3 pathogen.

Upgrades were made to the water purification systems and steam generator at the 95 Stone Rd facility. The upgrades were financed from funds generated by Laboratory Services. Other minor repairs and upgrades were also completed.

3.7 Quality Assurance

During 2002/2003, LS redesigned its quality management system to meet new ISO requirements ahead of the deadline. This was a major project involving all the operating and business support units. This enabled LS to successfully pass an external audit to achieve ISO9001:2000 status. The quality management system determines the overall quality policy for Laboratory Services. It must meet a stringent set of standards and is subject to regular external and internal audits.

The Animal Health Laboratory maintained accreditation by the American Association of Veterinary Laboratory Diagnosticians and the analytical laboratories maintained ISO 17025 status for their accredited tests.

The pesticide residue laboratory at 95 Stone Road became fully accredited as a GLP testing facility for pesticide residues for the purposes of registration studies. While this is not a requirement for OMAF, it allows LS to offer testing services for pesticide residue registration to industry clients and to Agriculture and Agri-Food Canada.

3.8 Research Activities & Innovation

3.8.1 Research

While Laboratory Services is not a research unit it does carry out method development and validation projects. Most of these are financed through income earned by LS through the sale of various services. During 2002/2003, external funding was obtained to support the following projects:

- Evaluation of immunoassay based kits with high sensitivity and specificity for rapid detection of E.coli 0157 in foods (OMAF, food safety)
- Field Validation of a Mycoplasma hyopneumoniae PCR assay (Ontario Pork)
- Development of a method for the detection of Cyclospora in raspberries and other foods (OMAF)

3.8.2 Innovation

There is an expectation under the general terms of the contract that Laboratory Services will generate sufficient funds to replace equipment and to introduce new technology so that over time its capabilities will keep pace with technological change. During 2002/2003, LS was able to

reinvest in both replacement and new technology. In addition to the general replacement of aging equipment, two major investments are worth noting.

Increasingly sophisticated technology is required to test for the growing list of chemical residues that are potential health hazards in food. In order to improve the detection limits and increase the scope of testing LS acquired a high-resolution liquid chromatograph. This instrumentation will support a broader scope of drug residue and pesticide residue testing in different matrices. The Canadian Food Inspection Agency recommends the use of this type of technology for confirmation of various chemical residues. It is rapidly becoming the "gold standard" for defining a positive finding.

Following from the previous year, we are continuing to invest in equipment to support molecular testing for diagnostic investigations. The advantages are improved turn around times, along with improved specificity and sensitivity. A MagnaPure LC was purchased for automated DNA extractions.

During 2002/2003 equipment acquired in the previous year was implemented and new methods were developed to expand the scope of testing. This was an unusually busy year for the development and validation of new tests with 70 new tests added to LS capabilities. The trend established in the previous year for more rapid and technically demanding tests continued and LS was able to respond. The increased testing allowed for an expanded depth and breadth of virology testing for both animals and plants. The testing for chemical contaminants in food was expanded to a broader scope of veterinary drug residues. Programs for surveillance for prion-related disease came into full production.

3.8.3 New Capabilities

Testing capabilities must be able to adapt to deal with emerging issues in the areas of animal health, plant health and food safety. The Laboratory Services Division is continually updating technology and test methods to be able to match capabilities with emerging needs. LS also recognizes the need for collaboration with other regulatory laboratories to ensure that data are comparable. LS scientists continue to work closely with their counterparts in the provincial veterinary diagnostic labs, the Canadian Food Inspection Agency reference laboratories, Health Canada and the Ministry of the Environment.

During 2002/2003, LS focused on a significant expansion of testing services and technology upgrades to enhance capabilities in the areas of PCR-based testing for pathogenic organisms and the expansion of screening and confirmation of chemical residues. Veterinary drug residue testing in tissue was identified as a target for expansion.

Testing for plant pathogens increased with the introduction of 25 new immuno-assay (ELISA) based tests for viruses, 4 for bacterial pathogens and 2 for fungal pathogens. The rapid ELISA methods will improve the specificity and the turn around time. The expanded service will benefit Ontario's horticulture and greenhouse industries.

The molecular biology group introduced a PCR based test for the detection of Cryptosporidium that applies to both water and horticulture crops.

The program for meat testing expanded to include a multi-residue method for veterinary drug residues as well as screening and confirmation methods for a broad range of anti-inflammatory

drugs, feed additives, steroids and antimicrobials. In all 19 new tests were accredited and 10 more were near completion by year-end. This will support a broader range of chemical testing in the food safety programs. New programs were introduced for the testing of cider and maple syrup.

The Animal Health Laboratory set up both serological and antigen tests for West Nile with additional financial support from OMAF. The West Nile testing will allow Ontario to establish a serological profile for horses and will be available to support public health investigations. Immunohistochemistry testing for chronic wasting disease and for bovine spongiform encephalopathy (BSE) went into full production. The AHL continued to move from less specific slow methods to immunohistochemistry and PCR based methods. In addition to the testing mentioned previously, the following new procedures were introduced.

Immunohistochemistry
Transmissible gastroenteritis virus
Bovine viral diarrhea virus
Bovine coronavirus
Porcine circovirus-2
Toxoplasma gondii
Leptospira spp.
West Nile virus
Cell markers – CD3, CD79a, CD18, vimentin, S100, melan-A

PCR
Mycoplasma hyopneumoniae, lung tissue
PRRS virus sequence analysis
Lawsonia intracellularis
Salmonella enterica serotype Typhimurium DT104
16S RNA gene sequence analysis for bacterial ID
scrapie resistance PrP genotyping
Brachyspira hyodysenteriae

3.9 Services Provided to OMAF

3.9.1 Food Industry Division Programs

The testing services provided by Laboratory Services support the provincial Milk Act, Meat Inspection Act, Edible Oils Products Act, Farm Products Grades and Sales Act and the Food Safety and Quality Act, 2001. The volume and type of testing is determined by the appropriate OMAF program manager. The tests vary in complexity from a milk fat analysis to a broad-based pesticide residue screen. Approximately 817,000 tests were performed in support of the food safety programs.

During 2002/2003 the raw milk program was reviewed and plans were developed to automate the sample and data tracking. This will result in increased availability of information and the streamlining of the sample handling processes.

The goat milk testing program was also reviewed. The industry indicated an interest in composition testing for goat milk. The dairy testing lab supported an initial study on composition testing.

The trend towards more complex testing of chemical residues in meat continued. Confirmation testing is now being done on an immediate basis so that action can be taken quickly. Improvements were made in the testing for the beta-agonist class of veterinary drugs. The lab also identified the need for close cooperation with the Canadian Food Inspection Agency (CFIA), so that methods used in the provincial program will be accepted by the CFIA. As a result, a development program was initiated to align existing and future confirmation methods with CFIA methods. Nineteen methods were validated to Standards Council of Canada standards. Considerable scientific resources were required to support this program.

The trend towards an increased scope of testing for horticulture products also continued. Metal testing continued. The lab supported a study on minimally processed vegetables.

3.9.2 Agriculture and Rural Division and Federal-Provincial Agreements

Laboratory Services provides support for plant diagnostics and soil mapping, as well as environmental testing in support of the Great Lakes initiative. The volume of testing depends upon OMAF or Ministry of the Environment program activities.

3.9.3 Livestock Technology Branch

Laboratory Services supports the disease surveillance activities of Livestock Technology through the Animal Health Laboratory (AHL). AHL provides a full range of diagnostic services to veterinarians who support the poultry and livestock industry. AHL's main activity is to provide accessible, highly reliable, and cost-effective diagnostic testing that includes a broad scope of tests. Data generated as a result of the diagnostic testing are made available to the Veterinary Science group within OMAF for the purposes of analyzing trends and identifying emerging diseases or urgent issues. AHL also supports the Federal Health of Animals Act as a primary source of information on reportable diseases. During 2001/2002, AHL was instrumental in the

identification of a case of bovine tuberculosis. Prompt action by the AHL allowed public health authorities to limit the potential for human exposure to the pathogen.

During 2002, the AHL processed 25,682 cases under the disease surveillance program. The lab completed 589,933 technical procedures under the OMAF supported programs. The volume of cases and procedures is similar to the previous year.

The AHL continued to develop molecular-based testing procedures (PCR) for the rapid assessment of microbial diseases. Twenty new tests were introduced. Testing for West Nile virus was enhanced to include both IGG and IGM serological testing in horses and PCR based testing for the West Nile antigen that can be applied to other species. The AHL supported a serological survey of West Nile in horses as well as supporting the ongoing surveillance program for birds.

In the early stages of the response to the detection of a single case of BSE in Alberta, the AHL automated communication network with veterinarians was used to support the communication of key messages and critical information to the food animal veterinarians that practice in Ontario. This network proved to be a useful tool for the rapid dissemination of information in an emergency.

3.9.4 Related Provincial Programs Not Covered by the Agreement

The AHL continued to support an enhanced BSE surveillance program based on a separate agreement with OMAF. The AHL uses the same resources to support testing for chronic wasting disease in elk and deer. The system is able to meet turnaround times that allow for prompt responsive actions to protect the food system.

Laboratory Services was contracted for a second year, through Agricorp, to provide testing services in support of a federal-provincial initiative to eradicate the plum pox virus in Ontario orchards. LS processed 250,000 tests during a 5-month period using high-volume ELISA techniques. The data generated as a result of this testing are essential to the strategy for managing the disease.

4. OTHER OMAF/U OF G AGREEMENT PERFORMANCE MEASURES

In addition to the primary areas covered by the OMAF/U. of G. Agreement (research, diploma education, Veterinary Clinical Education Program, and laboratory services), there are several other Performance Management Agreements (PMAs) which require reporting as part of the Annual Report. The objectives, performance measures and results for these PMAs are itemized below.

Reporting (Finance and Business)

Budget

The University must annually present the budget to OMAF for the Research, Diploma Education and Training, Veterinary Clinical Education Program (VCEP) and Laboratory Services programs. The University presented the 2003/2004 budget to the Executive Committee on May 9, 2003.

Quarterly Management Reports

The University is to submit financial management reports to OMAF within 6 weeks after the end of each quarter for the Research, Diploma Education and Training, Veterinary Clinical Education Program (VCEP) and Laboratory Services programs. In addition, a Transfer Payment report is to be filed each time. The University attained compliance with this PMA in 2002/2003.

Business Plan

The University is to submit a business plan covering the four programs (Research, Diploma Education, VCEP, Laboratory Services) each year, encompassing a brief description of each sub-program with each program, changes required to the program from the previous year, partnerships to be developed, staff strength and accommodation issues. The University fulfilled this PMA in 2002/2003.

Trust Funds

The University is to submit reports on the **'Post-Retirement'** and **'Non-Pension Post-Retirement'** trust funds, as well as the **'Agreement Research Trust Fund'** (formerly the 'Partnership Research Trust Fund'), along with the quarterly management reports. The University attained compliance with this PMA in 2002/2003.

Physical Facilities and Assets

This section includes PMA 's pertaining to:

- Annual reporting on **space utilization and rationalization**
- Submitting budgets and reporting annually on **operations and maintenance**, and updating of Schedule T
- **Review of facilities**, including annual deficiency reports and plans for addressing short, medium and long-term deficiencies.
- Reporting **sub-tenancies**, annually
- Submitting annually an **Asset Inventory and Planned Disposition Report**, detailing date of acquisition, estimated replacement value, ownership, condition, items sold, traded in or disposed of and revenues generated; intended dispositions for the coming year and livestock inventories.

Each of these entails reporting dates other than with the Annual Report. The University attained compliance with these PMA 's in 2002/2003.

Emergency Preparedness / Environmental Health and Safety

Emergency Preparedness Plan (PMA #6 under Physical Facilities and Assets)

The University is expected to maintain the Emergency Preparedness Plan, including provisions for review and update as required.

Health and Safety Management, and

The University is to maintain a Safety Management System for all locations regarding compliance with relevant legislation, training requirements for all staff and students, record keeping and communication requirement and other health and safety provisions, with a goal of zero lost-time accidents.

Environmental Management

The University is to ensure Environmental Management Plans are in place for all locations covering compliance with relevant legislation, management of incidents, identification of hazards associated with the programs, record keeping and communications, with a goal of zero incidents (spills, contamination, etc.).

Geoff Byford, of the University's Environmental Health and Safety Department provided the following update pertaining to these three PMA's.

"The University's Environmental Health and Safety (EHS) department is responsible for the development and implementation of occupational health and safety and environmental protection policies, programs and initiatives. The University's *Safety Policy Manual for Risk Management and Due Diligence* (at www.uoguelph.ca/HR/ehs) contains all of the institution's safety policies and outlines safety program details. The University promotes the internal responsibility system for workplace safety management and regulatory compliance. EHS provides advice and services in this regard to members of the University community. In particular, front-line managers and supervisors are provided support and guidance for workplace safety performance and due diligence.

The University has an incident reporting policy (i.e. safety policy number 851.04.02 titled *Injury and Incident Reporting*) and an Emergency Response Plan (ERP). The University's Security Services Department co-ordinates emergency response actions and up-dates the emergency contact lists and response action plans on an on-going basis. All workplaces are required by institutional policies to have fire safety plans and local emergency procedures.

During the period of time covered by this report, the following incidents were reported to EHS: the OMAF Elora Research Station experienced one lost time injury on February 3rd due to a fall on ice. Several litres of fuel oil were spilled at the Ponsonby Research Station on March 29th when a cracked filler hose was hung over the fuel tank's secondary containment.

Christi Cooper joined EHS in the Fall of 2002 as Industrial and Agricultural Safety Officer. Christi has primary responsibility for co-ordinating EHS involvement with safety program and training initiatives at OMAF-related facilities, and for promoting the internal responsibility system and safety culture at the Agricultural Colleges and affiliated research stations."

Indemnity and Insurance

The University was to submit certificates of all types of insurance to OMAF at the execution of the Agreement and submit renewal certificates as required. The University has submitted the certificates in compliance with this PMA.

4.1 Intellectual Property

Within the University of Guelph/OMAF Agreement, research can result in new intellectual property (IP). These usually take the form of patented technologies or cultivars that have been released. Each IP is presented at a Disclosure Meeting and the financial split between University

of Guelph and OMAF is agreed upon. Table 4.1-1 shows crop varieties and materials for which royalties were paid in 2002/2003. Table 4.1-2 shows the patented technologies and some trade secret technologies that are currently within the University's patent portfolio, along with a description of how IP developed in previous years has been used.

Some of the IP has been patented but has not been licensed. A number of reasons for this can be cited.

1. Insufficient improvement over older technologies to warrant investment in commercialization.
2. Future profit margins not great enough to warrant investment in commercialization.
3. Competing technologies in the R&D pipeline.
4. Too early stage with more research and/or proof of concept required.
5. Regulatory and consumer acceptance hurdles and associated costs.
6. Lack of strength in patent (freedom to operate, scope, and/or patentability).
7. A receptive industry partner could not be found. In some cases, products seem to be ahead of their time and take several years before they are ultimately licensed.

Some others look promising but never do get commercialized.

OMAF investment has resulted in the creation, identification, protection and commercialization of IP. Ideally, commercialization of new products results in new products for existing Ontario companies or the development of new industries in Ontario.

Cutting edge technologies result in new job creation. They also act as engines of economic growth in Ontario.

Some examples:

A patented harvest inducible gene promoter in plants allows foreign proteins that may be deleterious to the growth of the plant to accumulate after harvest of the crop. A material transfer agreement was executed in 2002 with a Canadian company to allow them to evaluate the technology for commercial production of industrial and pharmaceutical proteins. Many other interested parties have expressed interest.

A simple technique for improved preservation of fruits and vegetables has been developed. A license agreement was executed in 2001 with a local Venture Capital firm. A new University spin-off company has just recently been incorporated and assigned the license.

A Shipping Fever Vaccine was developed at the OVC. A license agreement executed in 1992 with a company in the United States continues to bring in significant royalties.

The soybean variety OAC Bayfield was released in 1993 and has been popular with growers ever since. This variety yielded 15% more than its competitors of similar maturity when it was first released. OAC Bayfield is estimated to have contributed an additional $40 million to Ontario farm gate receipts over its lifetime, compared to what would have occurred if the variety had not been developed, plus multiplier effects within the food and feed industries.

Table. 4.1-1: Varieties or Inbreds of Seed Crops for which Royalties were Received in 2002/2003

Alfalfa:	**Red Winter Wheat**:	**Soybean con't:**

OAC Minto

Barley:
OAC Baxter
OAC Kippen

Canola:
Dorothy
Lolinda
Acropolis
Explorer
Hurricane
Dynamite

Corn Inbreds:
CG24
CG33
CG38
CG62

Oat:
OAC Arrow
OAC Markdale
OAC Paisley

Red Clover:
Laser
Freedom
RC Doyle

Soybean:
Bicentennial
OAC Atwood
OAC Erin
OAC Prudence
OAC Clinton
OAC Kent
OAC Champion
OAC Arthur
OAC Bayfield
OAC Brussels
OAC Elora
OAC Embro
OAC Exeter
OAC Glencoe
OAC Lucknow
OAC Mirage
OAC Salem
OAC Vision
OAC Walton
OAC Wingham
OAC Millenium
OAC Nepean
OAC Oxford
OAC Woodstock
OAC 98-32
RCAT 9910
RCAT Bobcat
RCAT Columbus
RCAT Legacy
Westag 97
RCAT Staples
Ivory
CK-01
AV2261
Pro28-53
RCAT 9904

White Bean:
Thunder
OAC Rex
OAC Silvercreek

Winter Barley:
OAC Elmira

White Winter Wheat:
OAC Ariss

Table. 4.1-2 Varieties which are not Propagated from Seed that have Brought in Royalties in 2002/2003.

Asparagus:
Millennium

Peach:
Venture
V84012
V84061
V851610
V84023
V84101

Plum:
Vanette
Valerie

Strawberries:
Startyme
G19
Sapphire
Serenity

Sweet Cherries:
Tehranivee
Vandalay

Table 4.1-3. Significant non-OMAF capital investments leveraged during 2002/2003 at least partly as a result of the OMAF contract.

Description of Capital Investment	Sponsor	$ Amount
Renovation and expansion of OVC's Veterinary Teaching Hospital, diagnostic laboratories and research infrastructure	Government of Canada (AAFC)	$37 million
Institute for Animal-Human Links in Health Science Research at OVC	Ontario Innovation Trust Canadian Foundation for Innovation	$11 million $11 million
Non-OMAF dollars raised at Alfred College in support of minority language educational programs Non-OMAF dollars raised at Alfred College in support of infrastructure and non-research programs	Heritage Canada Other sponsors	$250,000 $250,000
Non-OMAF dollars raised at Kemptville College in support of infrastructure	Various sponsors	$165,417
Non-OMAF dollars raised at Ridgetown College in support of infrastructure	Various sponsors	$600,000
The Capital Campaign at the University of Guelph had reached approximately $70 million by the end of the 2002/2003 fiscal year. Significant capital projects include a new Science Complex currently being constructed, a planned addition to the Crop Science and Land Resource Science Buildings, additions to the School of Hospitality and Tourism Management Building, and Rozanski Hall, a new teaching building.	Various sponsors	The estimated 2002/2003 portion related to the OMAF Agreement was $10 million

4.2 Patent Portfolio

The portion of the University of Guelph's Patent Portfolio that includes the active patents and a few non-patented trade secrets which have been jointly developed with OMAF is shown in Table 4.2-1.In 2002-2003, the total cost of developing or maintaining patents with OMAF involvement was $109,000.

Table 4.2-1.University of Guelph-OMAF Patent Portfolio

Title	Tech Status
JEB diagnostic test for Belgian horses	License
The use of germ-line competent (GLC) cells to produce germ-line chimeric chickens.	License
Production of Human Immunoglobulins in Chicken Eggs	License
Custom Feed Supplement to Maximize Omega-3 Fatty Acids in Cow's Milk	License
Method of identifying high immune response periparturient animals	License
Process to induce desiccation tolerance in somatic embryos	License
Enhanced Root Production in Transgenic Perennial Plants	License
Diagnosis for Porcine Malignant Hyperthermia	License
Development of a Novel Antioxidant Formulation to Control Superficial Scald in Apples	License
Compositions for the preservation of fruits and vegetables	License
Inhibition of Phospholipase D activity by C6 Aldehydes and Alcohols	License
Vaccine for Prevention of Pasteurella haemolytica pneumonia in Cattle.	License
Process for clarifying milkhouse wastewater	License
* Porcine embryo transfer for genetic support	License
* Cytopathic type 2 bovine viral diarrhea virus (BVDV) strain 53637	License
* Brassica napus hybrid - NMS pollination	License
* Acidophilus/bifidus milk products	License
Micropropagation technologies for phytopharmaceutical: St. John's Wort	License Option
Identification of Metabolites and Key Enzymes in Skatole Metabolism in Liver	License Option
Genetic Marker for Boar Taint in Sulphur Transferase	License Option
Method for Identifying Pigs with Genetically Reduced Levels of Boar Taint Steroids	License Option
Genetic Markers for Pigs with Low Skatole (P450IIE)	License Option
Porcine Adenovirus Based Vector, Vaccine	License Option
Reduction of Sperm Sensitivity to chilling/freezing of Swine Semen	Marketing
Novel Inducible Genes from Alfalfa and Methods of Use Thereof	Marketing
High Liquid Margarine with Low Saturated Fatty Acids and Zero Trans Fatty Acids	Marketing
Transgenic animals expressing salivary phytase	Marketing
NOTES	
"*" means that invention is protected by trade secret and not patents	
"**License**" means that a commercial license has been completed.	
"**License Option**" means that an option for a commercial license has been granted.	
"**Marketing**" means that invention is currently being marketed to industry.	

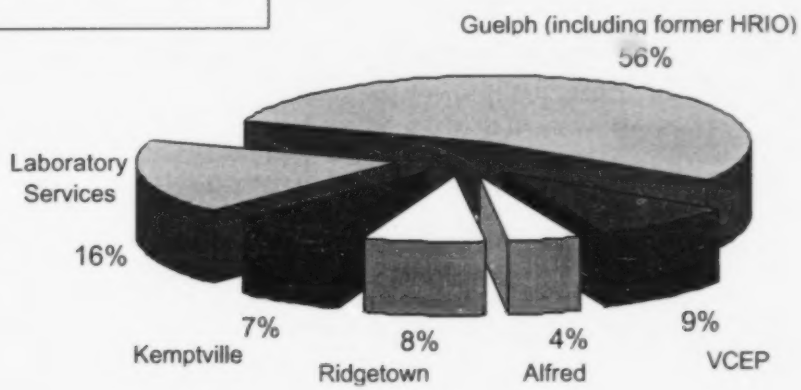
5. FINANCIAL SUMMARY

This presentation shows the net actual expenditure (i.e., total expenses less revenues) by unit for OMAF transfer funds, and reflects use of carry forwards from fiscal 2001/2002 and any surplus/deficit (carry forwards) outstanding at year end 2002/2003.

The actual transfer of funds under the OMAF University of Guelph agreement was $50.5 million in 2002/2003. The total net expenditure of $50.9 million reflects a $400,000 overall drawdown of carryforward funds. Carryforwards for individual units may have been used or increased depending on the expenditure levels and operations of those individual units. Other sections of this report should be consulted for more detail.

Fig. 1. Distribution of Transfer Payment 2001/2002

	2002/2003 Program Costs	
Location	**($ millions)**	**%**
•Guelph [1]	$28.6	56%
•VCEP[2]	4.6	9%
•Alfred	2.2	4%
•Ridgetown	4.0	8%
•Kemptville	3.3	7%
•Laboratory Services	8.2	16%
•Total	**$ 50.9**	**100%**

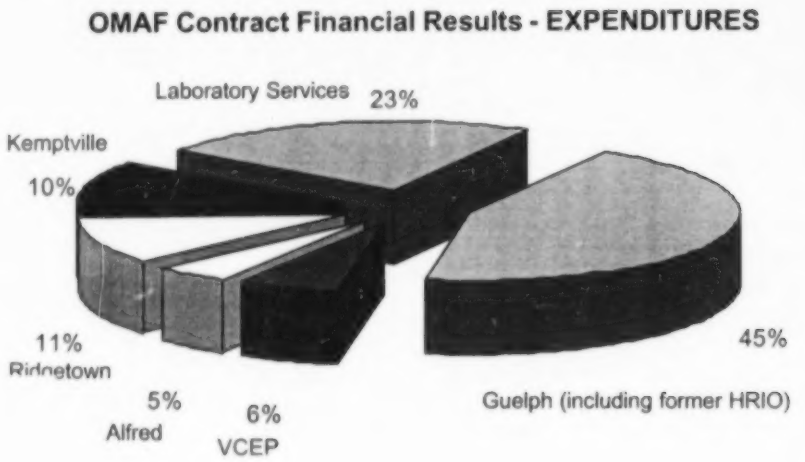


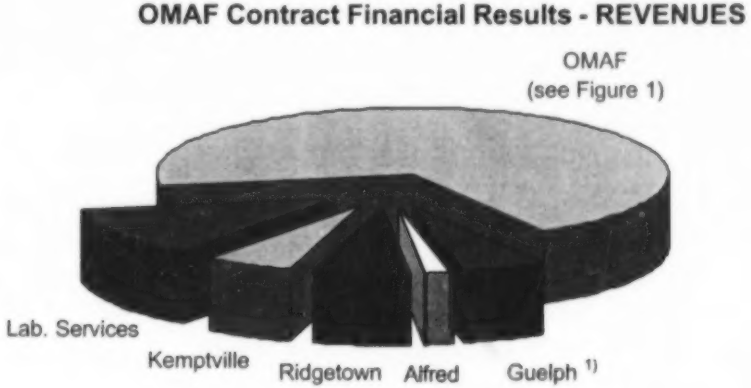
[1] Includes expenditures for research stations, former HRIO locations (Vineland, Simcoe, Bradford) and all Guelph campus research and diploma education activities. HRIO operations were included with Guelph operations beginning May 2002.

[2] Veterinary Clinical Education Program

Fig. 2. OMAF Contract Financial Results – 2002/2003 Expenditures and Revenues

Location	Expenditures $	Expenditures %	Revenues $	Revenues %
OMAF Agreement			50.9	69%
Guelph [1]	32.7	44%	4.0	5%
VCEP [2]	4.6	6%	0.0	0%
Alfred	3.4	5%	1.3	2%
Ridgetown	8.3	11%	4.3	6%
Kemptville	7.5	10%	4.2	6%
Lab. Services	17.2	23%	9.0	12%
Total:	*73.7*	*100%*	*73.7*	*100%*





(1) Includes expenditures for research stations, former HRIO locations (Vineland, Simcoe, Bradford) and all Guelph campus research and diploma education activities. HRIO operations were included with Guelph operations beginning May 2002.

(2) Veterinary Clinical Education Program

Table 5-1: OMAF Program Summary – Expenditures and Revenues vs Budget by Location

Program Area	Alfred			Kemptville			Ridgetown			Lab Services Div.			Guelph			TOTAL		
	Budget	Actual	Balance	*Budget*	Actual	Balance	*Budget*	Actual	Balance	*Budget*	Actual	Balance	*Budget*	Actual	Balance	*Budget*	**Actual**	Balance
Research																		
Total Expenses	102	114	(11)	2,225	2,241	(15)	2,681	2,587	93	-	18	(18)	22,990	23,594	(603)	27,999	28,553	(554)
Revenues	-	24	24	260	386	126	365	260	(105)	-	20	20	1,120	1,692	572	1,745	2,382	637
Net Expenses	***102***	***89***	***13***	***1,965***	***1,855***	***110***	***2,316***	***2,328***	***(11)***	***-***	***(2)***	***2***	***21,870***	***21,902***	***(32)***	***26,254***	***26,171***	***82***
Education																		
Total Expenses	1,856	1,722	134	3,698	4,095	(397)	4,812	4,731	81	-	-	-	1,821	1,808	13	12,187	12,356	(169)
Revenues	1,132	948	(184)	3,248	3,758	510	3,277	3,973	696	-	-	-	1,421	1,412	(9)	9,078	10,091	1,013
Net Expenses	***723***	***774***	***(51)***	***450***	***337***	***114***	***1,535***	***758***	***777***	***-***	***-***	***-***	***401***	***396***	***4***	***3,109***	***2,265***	***844***
Veterinary Clinical Education Program (VCEP)																		
Total Expenses	-	-	-	-	-	-	-	-	-	-	-	-	4,598	4,597	1	4,598	4,597	1
Revenues	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Expenses	***-***	***-***	***-***	***-***	***-***	***-***	***-***	***-***	***-***	***-***	***-***	***-***	***4,598***	***4,597***	***1***	***4,598***	***4,597***	***1***
Laboratory Services																		
Total Expenses	-	-	-	102	105	(3)	-	-	-	11,379	11,555	(176)	62	38	24	11,543	11,698	(155)
Revenues	-	-	-	-	-	-	-	-	-	6,611	7,919	1,307	-	-	-	6,611	7,919	1,307
Net Expenses	***-***	***-***	***-***	***102***	***105***	***(3)***	***-***	***-***	***-***	***4,767***	***3,636***	***1,131***	***62***	***38***	***24***	***4,931***	***3,779***	***1,152***
Institutional Infrastructure and Support																		
Total Expenses	1,443	1,579	(136)	1,313	1,089	224	1,106	983	123	5,585	5,628	(43)	5,233	7,193	(1,961)	14,680	16,472	(1,792)
Revenues	272	285	13	26	72	46	30	86	55	985	1,032	47	775	902	127	2,088	2,377	288
Net Expenses	***1,171***	***1,293***	***(122)***	***1,288***	***1,017***	***271***	***1,076***	***897***	***178***	***4,600***	***4,596***	***4***	***4,458***	***6,292***	***(1,834)***	***12,592***	***14,096***	***(1,503)***
Total - All Programs																		
Total Expenses	3,401	3,415	(13)	7,338	7,530	(191)	8,599	8,301	297	16,964	17,201	(237)	34,704	37,230	(2,526)	71,006	73,677	(2,670)
Revenues	1,404	1,257	(147)	3,534	4,216	682	3,672	4,319	646	7,596	8,971	1,374	3,316	4,006	690	19,522	22,769	3,245
Net Expenses	***1,996***	***2,156***	***(160)***	***3,806***	***3,314***	***492***	***4,927***	***3,983***	***944***	***9,367***	***8,230***	***1,137***	***31,388***	***33,225***	***(1,837)***	***51,484***	***50,908***	***576***

6. MEDIA COVERAGE

Between May 2002 and April 2003, the combined efforts of students in Owen Roberts's agricultural communication classes and in Students Promoting Awareness of Research Knowledge (SPARK), both based at the University of Guelph, have produced the following list of published articles and stories on a variety of OMAF-sponsored projects. These articles have appeared in a number of different periodicals and publications, and cover the spectrum of the university's many different research institutions and sites, including the Axelrod Institute of Ichthyology, Laboratory Services Division, the regional colleges – Kemptville College, Ridgetown College and College d'Alfred – and the research stations in Vineland and Arkell, as well as the six colleges on U of G's main campus. The main vehicles for publication are the Ontario farm media, the Guelph *Mercury* through the weekly column *SPARKPlugs* and the University's *Research* magazine. In addition, select articles are also distributed over the Canadian Press Wire Service, which allow for extensive exposure of OMAF's research projects. A new agreement with OMAF's Town & Country Ontario television now sees the students contribute InfoBreaks to that program, as well. These and other articles can be accessed from the UofG Research News website at www.uoguelph.ca/research/news/index.shtml and general information on the University's research communications can be found at www.uoguelph.ca/research/communications/index.shtml

* * *

"Spare the dog: Questions arise over whether a problematic parasite in cattle is canine-related," *Research* magazine – Summer 2002 (Andrew Peregrine – Department of Pathobiology)

"An inside job: New probiotics could treat canine intestinal infections," *Research* magazine – Summer 2002 (Scott Weese – Department of Clinical Studies)

"A kinder, gentler vaccination: Researchers explore the possibilities of edible health technologies," *Research* magazine – Fall 2002 (Larry Erickson - Department of Pathobiology)

"Kissin' cousins: Strawberries can now share genes with their distant relatives," *Research* magazine – Fall 2002 (Alan Sullivan – Department of Plant Agriculture)

"When champs get cramps: They're not getting rid of lactic acid and carbon dioxide efficiently," *Research* magazine – Spring 2003 (Henry Staempfli and Mondest Vengust – Department of Clinical Studies)

"Eating Green: High-fat diets may be as unhealthy for horses as they are for humans," *Research* magazine – Spring 2003 (Jill McCutcheon - Department of Pathobiology)

"Dreaming like sleeping beauty: What's the safest equine anesthetic available to veterinarians?" *Research* magazine – Spring 2003 (Wayne McDonell – Department of Clinical Studies)

"Healthy hearts beat the odds: Heart rate range is critical under anesthetic," *Research* magazine – Spring 2003 (Wayne McDonell - Department of Clinical Studies)

"Putting the heart before the horse," *Research* magazine – Spring 2003 (Wayne McDonell and Carolyn Kerr - Department of Clinical Studies)

"When nature's calling at the wrong time: New minimally invasive surgery will repair ruptured bladders in foals," *Research* magazine – Spring 2003 (Ludovic Boure - Department of Clinical Studies)

"Sweeter dreams: Epidural anesthesia means safer surgery for critically ill foals." *Research* magazine – Spring 2003 (Carolyn Kerr and Ludovic Boure - Department of Clinical Studies)

"Skin detectives: Root of devastating skin disorder in Belgian horses s identified." *Research* magazine – Spring 2003 (John Baird - Department of Clinical Studies)
@ Guelph – October 23 2002

"Mare to foal: Let's talk: The struggle to discover reasons for early embryo loss continues." *Research* magazine – Spring 2003 (Keith Betteridge - Department of Biomedical Sciences)

"How hormones help." *Research* magazine – Spring 2003 (Jim Raeside - Department of Biomedical Sciences)

"A chilly conception: The cool market for stallion semen starts warming up," *Research* magazine – Spring 2003 (Mary Buhr - Department of Animal Poultry Science)

"When fertility fails: International partnership explores mysterious cystic follicles," *Research* magazine – Spring 2003 (Jim Petrik - Department of Biomedical Sciences)

"Clearing the air about garlic: Researchers question its equine benefits," *Research* magazine – Spring 2003 (Mike Lindinger - Department of Human Biology and Nutritional Sciences)
SPARKPlug - Guelph Mercury – August 29, 2002
Town & Country Ontario Infobreak, 2003

"Winning the asthma race: Protein may lead to small airway disease detection," *Research* magazine – Spring 2003 (Dorothee Bienzle - Department of Pathobiology)

"Fortifying a foal's first flight: New vaccine could prevent deadly bacterial pneumonia," *Research* magazine – Spring 2003 (John Prescott - Department of Pathobiology)

"Healthy strategy makes horse sense," *Research* magazine – Spring 2003 (Carolyn Kerr - Department of Clinical Studies)

"Better heartbeats for better hoofbeats: Defibrillation can help a horse's hearbeat recover" *Research* magazine – Spring 2003 (Peter Physick-Sheard - Department of Clinical Studies)

"Where hooves take a beating: Some surfaces are better than others for hoof health," *Research* magazine – Spring 2003 (Jim Dickey - Department of Human Biology and Nutritional Sciences)

"A shoe-in for absorbing impact: Versatility is the key to a hoof's inner workings," *Research* magazine – Spring 2003 (Jeff Thomason - Department of Biomedical Sciences)

"Feed gone foul: Fusarium-contaminated feed can put horses at risk," *Research* magazine – Spring 2003 (Susan Raymond – Equine Guelph)

"Surveillance program leads the pack: A global perspective distinguishes this flu vaccine search," *Research* magazine – Spring 2003 (Laurent Viel - Department of Clinical Studies)

"Numbing sooner: Epidural treatments are effective for short-term injuries," *Research* magazine – Spring 2003 (Carolyn Kerr - Department of Clinical Studies)

"New West Nile virus tests first in Canada," *Research* magazine – Spring 2003 (Scott Weese - Department of Clinical Studies)

"Bucking the bug: Probiotic may help cure some illness," *Research* magazine – Spring 2003 (Scott Weese - Department of Clinical Studies)

"New insurance plan helps farmers see sun," *SPARKPlug - Guelph Mercury* – July 6, 2002 (Calum Turvey – Department of Agricultural Economics and Business)

"Pregnant cows need comforts too, research finds," *SPARKPlug - Guelph Mercury* – September 3, 2002 (Ken Leslie – Department of Population Medicine)
Ontario Milk Producer – August 2002
Country Guide - August 2002

"Researchers to keep apples appealing," *SPARKPlug - Guelph Mercury* – November 2, 2002 (Vasantha Rupasinghe – Guelph Centre for Functional Foods, Laboratory Services)

"Local professor grows knowledge of herbal remedies," *SPARKPlug - Guelph Mercury* – July 6, 2002 (Praveen Saxena – Department of Plant Agriculture)

Weeding out plant remedies: Controlling herbs makes for good medicine," @ Guelph – March 26, 2003 (Praveen Saxena – Department of Plant Agriculture)

"Validating sausage production: Food safety regulations made more work for those making dry fermented sausage," Ontario Hog Farmer – December 2002 (Shai Barbut and Mansel Griffiths – Department Food Science)
Country Guide - November 2002

"Healthy Pigs, healthier food chain: Environmentally friendly selection methods boost immune systems of farm animals," Ontario Hog Farmer – February 2002 (Bruce Wilkie and Bonnie Mallard – Department of Pathobiology)

"Water hogs: Sewage treatment may nor be agriculture's solution for waste management because it uses too much water," Ontario Hog Farmer – December/January 2002 (Ron Fleming – Ridgetown College)

"A better way: Improved system developed to rank and select sires for longevity," Ontario Milk Producer – May 2003 (Larry Schaeffer – Department of Animal and Poultry Science)

"Immunization boost: Clinical mastitis reduced when vaccinations complete before calving," Ontario Milk Producer – March 2003 (Christina Petersson – Department of Population Medicine)
Country Guide - December 2002

"Factoring in comfort: Lying down on the job is likely to put more milk in the bulk tank," Ontario Milk Producer – February 2003 (Brian McBride, Tina Widowski – Department of Animal and Poultry Science)
Country Guide – February 2003

"Off to a fast start: Supplemental light can enhance performance of your calves," Ontario Milk

Producer – December 2002 (Vern Osborne – Department of Animal and Poultry Science)

"Fall feed alert: Drought can change nutrient composition of silage and grain corn," Ontario Milk Producer – October 2002 (Holy Holyoake – Department of Animal and Poultry Science)
Country Guide – October 2002

"Phosphorus excess: Cows choosing for themselves could curb too much of a good thing," Ontario Milk Producer – December 2002 (Brian McBride – Department of Animal and Poultry Science)
Country Guide – September 2002

"New tool in the offing: A CLA feed supplement could help you manage fat and your quota," Ontario Milk Producer – July 2002 (John Cant – Department of Animal and Poultry Science)

"Timing's the key: Pre-calving vitamin E injection can boost your cows' immune systems," Ontario Milk Producer – June 2002 (Stephen LeBlanc – Department of Population Medicine)

"Balancing act: The protein you feed you herd could help you manage quota," Ontario Milk Producer – May 2002 (John Cant – Department of Animal and Poultry Science)

"More good fats: it's an inside job," Ontario Beef – May 2003 (Ira Madell – Department of Animal and Poultry Science)

"Beefing up immunity: New facility focuses on how to help animals stay strong against disease," Ontario Beef – May 2003 (Jeff Caswell – Department of Pathobiology)

"Nitrogen losses need to be quantified," Ontario Beef – February 2003 (John Lauzon – Department of Land Resource Science)
Country Guide – April 2003

"Going with the flow: How do nutrients and bacteria move through soil?" Ontario Beef – May 2003 (John Lauzon – Department of Land Resource Science)

"Plant potential: Planting grass strips along streams may reduce contamination,"
Ontario Beef – May 2002 (Ann Clark – Department of Plant Agriculture)
Town & Country Ontario Infobreak 2002

"Plant potential: Planting grass strips along streams may reduce contamination," Ontario Beef – May 2002 (Ramesh Rudra – School of Engineering)

"Soil test get a second look for accuracy," *PIGPENS – Spring* 2003 (Michael Goss – Department of Land resource Science)

"Fighting virus with virus," *PIGPENS* – Summer 2002 (Eva Nagy – Department of Pathobiology)

"A pro-active approach to on-farm food safety," *PIGPENS* – Summer 2002 (Robert Friendship – Department of Population Medicine)

"Moving towards taint-free pork," *PIGPENS* – Summer 2002 (Ina Duncan and Jim Squires – Department of Animal and Poultry Science)

"Faster identification of IBV isolates: Diagnostic tools are being developed for more effective control programs," *Nuggets* – Spring 2002 (Eva Nagy – Department of Pathobiology)

"New technology for an old problem: Scientist are on the verge of a breakthrough in skeletal research," *Nuggets* – Spring 2002 (Steve Leeson – Department of Animal and Poultry Science)

"Shedding light on starve-out: Death in turkey poults linked to artificial lighting schedules," *Nuggets* – Spring 2002 (Ian Duncan – Department of Animal and Poultry Science)

"Awaiting the charr: Aquaculture centre helps Inuit community reclaim long-lost fishery," *Aquatalk* – Fall 2002 (Geoff Klein – Nunavit Research Centre)

"Cole notes: BOD is bad: Collaborative efforts helps to reduce environmental impact of fish feed," *Aquatalk* – Fall 2002 (Dominique Bureau – Department of Animal and Poultry Science)
Country Guide – October 2002

"Warming-up to Alma: Infrastructure support will enhance recirculation aquaculture research," *Aquatalk* – Fall 2002 (Rich Moccia – Department of Animal and Poultry Science)

"Open to solutions: New technology further enhances natural aquaculture systems," *Aquatalk* – Spring 2002 (Rich Moccia – Department of Animal and Poultry Science)

"Today's special: Arctic charr: Improved growth rate is essential if more farm-raised charr is gong to find its way to consumers," *Aquatalk* – Spring 2002 (John Leatherland – Department of Biomedical Sciences)

"A glass of wine and ounce of prevention: Cancer-fighting phenols in red wine leave normal cells healthy," @ Guelph – October 23, 2002 (Gopi Paliyath – Department of Food Science)

"Chocolate: the inside story," @ Guelph – February 12, 2003 (Alejandro Marangoni – Department of Food Science)

APRIL 2003
7. UNIVERSITY OF GUELPH/ OMAF EQUIPMENT INVENTORY & LIBRARY RESOURCES

The following summary of estimated equipment replacement values is submitted in compliance with the requirements of the Memorandum of Agreement:

Equipment Inventory Summary (as of June 2003)

Locations:		From Inventory Listings: Replacement Value (RV-'000s)	Book Value (BV)	Total Estimated Equipment Replacement Value ('000s)	Notes:	Leased Equipment Value (incl. in Total ERV)
Guelph Research Stations Operations		5,786	0	5,786		2,850
Alma		164	622	1,097	= BV*1.5+RV	-
Arkell Bull		40		40		-
Arkell Equine		5		5		-
Arkell Feedmill		812		812		-
Arkell Poultry		660		660		-
Arkell Swine		516		516		-
Elora Beef		891		891		-
Elora Dairy		1,292	796	1,292		-
Elora/Woodstock Plant & Environment		3,333		3,333		525
Ponsonby Dairy		407		407		-
Ponsonby General Animal Facility		307		307		-
Ponsonby Sheep		166		166		-
OMAF Isolation Unit		14	11	14		-
Guelph Turf Grass Institute		24		24		-
Cambridge		690		690		14
Bradford Muck Stations		291		291		-
Simcoe		907		907		147
Vineland *		2,565		2,565		-
Guelph Area Stations	**Total**			**19,803**		**3,536**
Alfred	**Total**	1,713	1,892	**2,838**	=BV*1.5	-
Kemptville	**Total**	3,043	2,964	**4,446**	=BV*1.5	301
Includes: Kemptville		1,460	1,380			
Thunder Bay		99	99			
Emo		61	61			
New Liskeard		1,425	1,425			
Ridgetown	**Total**		4,562	**6,844**	=BV*1.5	-
Includes: Huron & Cedar Springs						
Lab Services Division			22,396	**33,595**	=BV*1.5	-
Total Equipment Inventory Value:				**67,525**		3,837

Library Resources

Alfred	1,788
Kemptville	1,394
Ridgetown	581
Vineland	420
Total Library Resources Value ('000s):	4,183

Note: In 2002/2003 the University established an updated equipment and library resources inventory system, standardized across all locations. The inventory listing underwent a thorough review at all locations. As a result, the estimated 'book values' and/or 'replacement values' shown much better reflect the inventory values at each location.

* Due to a formula error in the spreadsheet, the Vineland inventory value (as a component of the HRIO total) reported in the 2001/2002 Annual Report was mistakenly overstated by approx. $3.3 million.

APRIL 2003
8. INVENTORY AND RENTS OF DWELLING HOUSES STATUS

Kemptville College	**# Units**		
Kemptville	1		
New Liskeard	3		
Total	4		
Revenue		13,204	
Expenses		3,262	
Account balance: Opening			**32,823**
Closing			**42,765**

Ridgetown College			
Ridgetown	2		
Cedar Springs	1		
Total	3		
Revenue		21,813	
Expenses		18,237	
Account balance: Opening			**38,124**
Closing			**41,700**

Guelph Stations			
Ariss	3		
Cambridge	1		
Alma	1		
Hall House	1		
Ponsonby	1		
Arkell	3		
Simcoe	1		
Vineland	2		
Total	13		
Revenue		70,440	
Expenses		43,989	
Account balance: Opening			**(20,586)**
Closing			**5,865**

APRIL 30, 2003
9. LIVESTOCK INVENTORIES

	OPENING MAY 1, 2002	SOLD	DIED [1]	TRANSFERRED		BORN OR ACQUIRED	CLOSING APRIL 30, 2003
				IN	OUT		
ALFRED							
DAIRY	68	49	8	0	0	47	58
KEMPTVILLE							
DAIRY	73	43	33	0	0	101	98
NEW LISKEARD							
BEEF	278	141	4	0	0	149	282
SHEEP	326	181	102	0	554	511	0
RIDGETOWN							
DAIRY	73	35	5	0	0	37	70
BEEF	150	132	0	0	0	18	36
SWINE	274	879	74	12	1	1,137	469
GUELPH							
ARKELL EQUINE	50	0	2	110	109	19	68
ARKELL POULTRY	3,537	777	1,480	0	6,009	9,372	4,643
ARKELL SWINE	1,478	3,054	1,581	0	922	5,809	1,730
ALMA AQUA	147,800	17,600	141,800	7,300	5,500	122,100	112,300
CLINICAL STUDIES (DAIRY)	76	22	1	24	9	0	68
ELORA DAIRY	300	58	11	16	81	130	296
ELORA BEEF	485	226	5	4	24	227	461
PONSONBY DAIRY	100	26	8	17	35	55	103
PONSONBY (GAF) [2]	73	105	4	111	47	72	100
PONSONBY SHEEP	333	241	30	0	57	364	369

[1] These figures include animals that are born dead and those which are euthanized for humane, disease and research reasons.

[2] General Animal Facility

10. ACRONYMS

AAFC	Agriculture and Agri-Food Canada
AHL	Animal Health Laboratory
ARD	Agriculture and Rural Division
ARIO	Agricultural Research Institute of Ontario
AVMA	American Veterinary Medical Association
BDTG	Business Development Training Group
BMP	Best Management Practice
BSE	Bovine Spongiform Encephalopathy
CARCI	Canadian Agricultural Rural Communities
CCA	Certified Crop Advisor
CE	Continuing Education
CFI	Canadian Foundation for Innovation
CFIA	Canadian Food Inspection Agency
CIDA	Canadian International Development Agency
CPCFSE	The Canadian Partnership for Consumer Food Safety Education
CRIFS	Canadian Research Institute for Food Safety
CVMA	Canadian Veterinary Medical Association
CVO	College of Veterinarians of Ontario
DVM	Doctor of Veterinary Medicine
DVSc	Doctor of Veterinary Science
FID	Food Industry Division
FTE	Full Time Equivalent
FSDSS	Food Safety Decision Support System
GC	Gas Chromatograph
GLP	Good Laboratory Practices
GMO	Genetically Modified Organisms
HPLC	High Pressure Liquid Chromatograpgy
HRIO	Horticultural Research Institute of Ontario
IP	Intellectual Property
IPM	Integrated Pest Management
ISO	International Standards Organization
LS	Laboratory Services Division
MOA	Memorandum of Agreement
MOE	Ministry of the Environment
MTCU	Ministry Training, Colleges and Universities
NSERC	National Sciences and Engineering Research Council
OAC	Ontario Agricultural College
OFVGA	Ontario fruit and Vegetable Growers' Association
OMAF	Ontario Ministry of Agriculture and Food
OPT&C	Ontario Pesticide Training and Certification Program
ORC	Ontario Realty Corporation
OVC	Ontario Veterinary College
PCR	Polymerase Chain Reaction
PMA	Performance Measures Agreement
RM&E	Resource Management and Environment
RSO	Research Stations Operations
SPARK	Students Promoting Awareness of Research Knowledge
SRC	Sustainable Rural Communities
TORC	The Ontario Rural Council
UofG	University of Guelph
VCEP	Veterinary Clinical Education Program

VTH	Veterinary Teaching Hospital
VTNE	Veterinary Technician National Examination
WUSC	World University Service of Canada